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CAR AND DRIVER

JUL/2016

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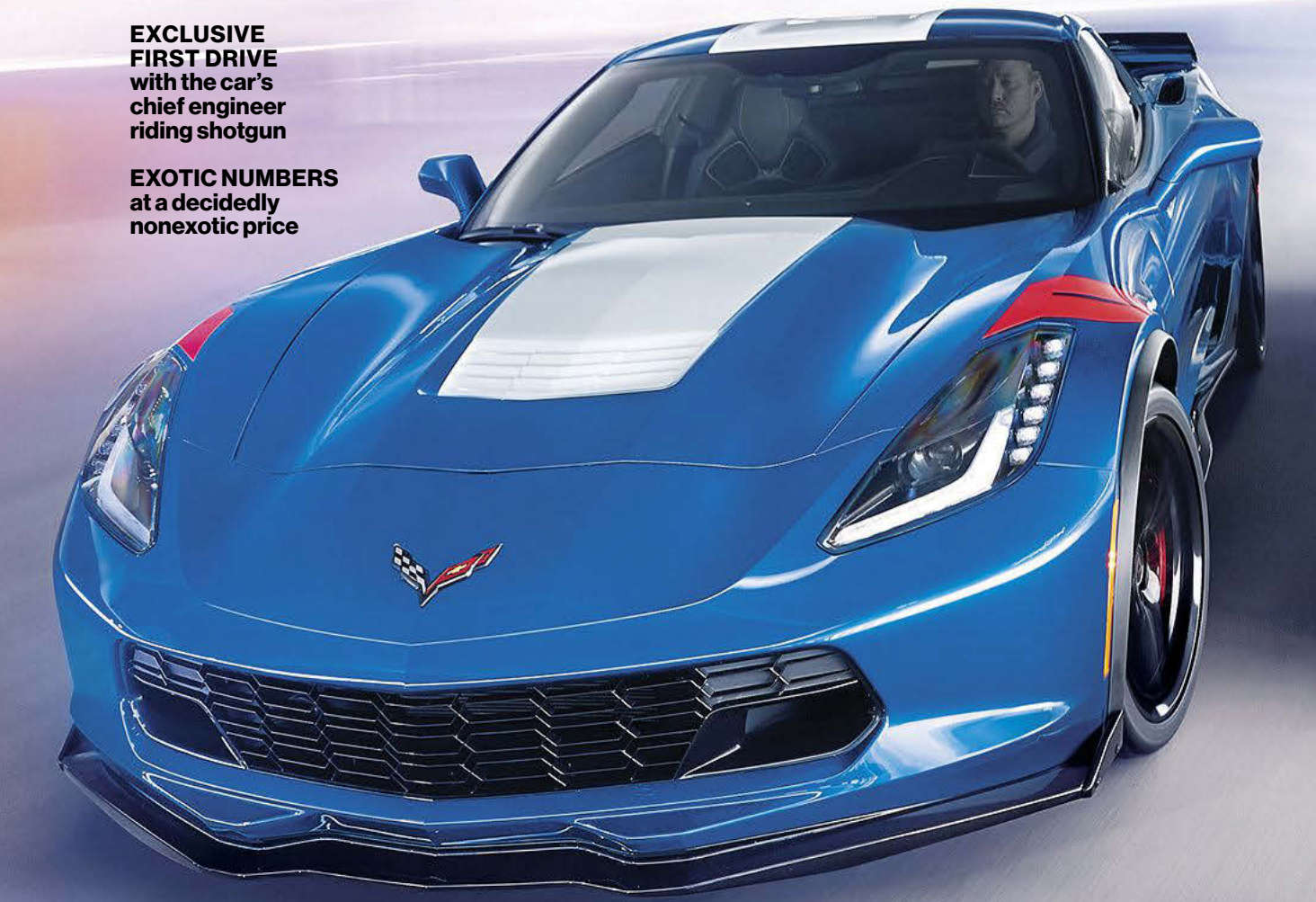

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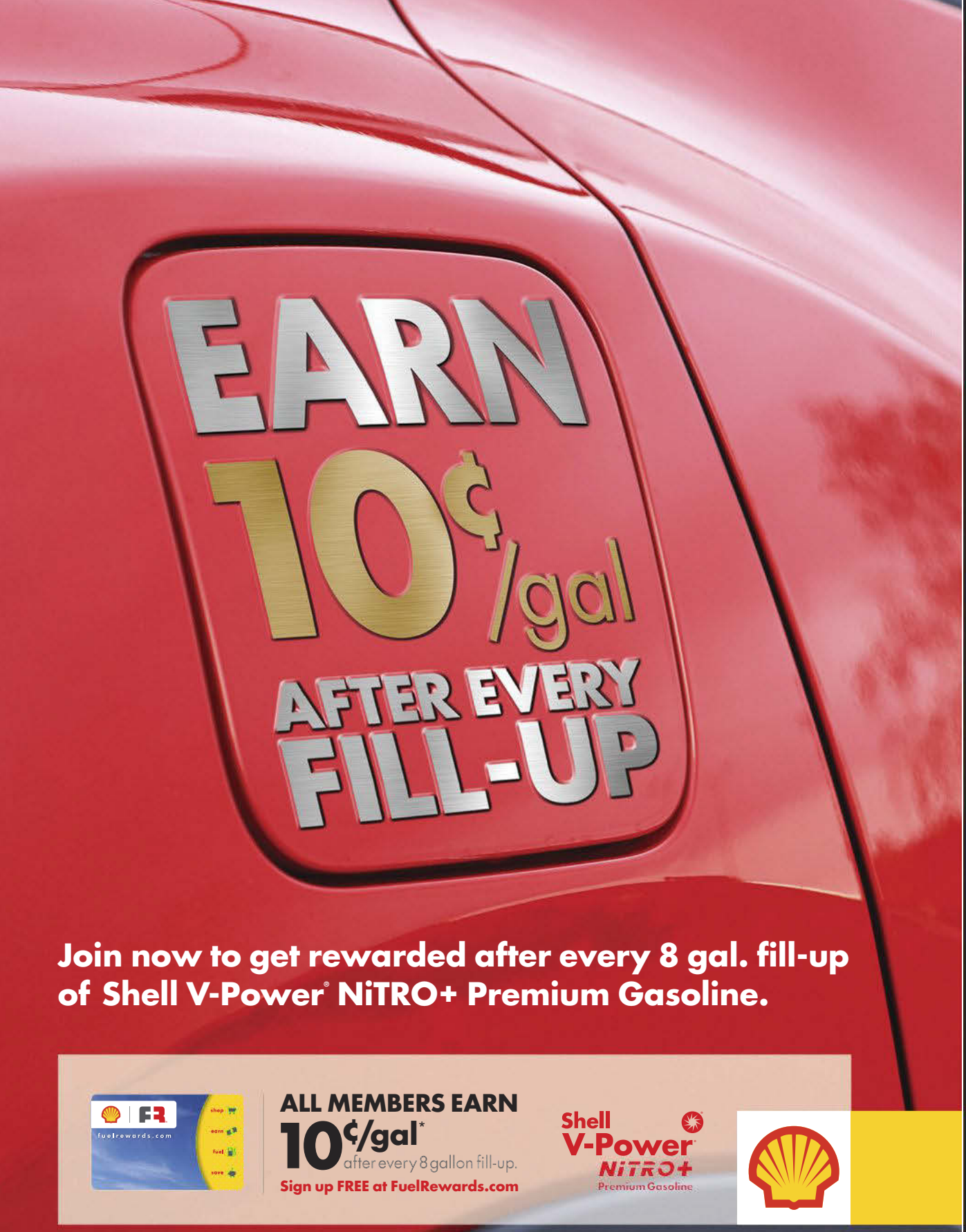
and...Eddie Van Halen has a 911 GT3 RS and is not afraid to use it



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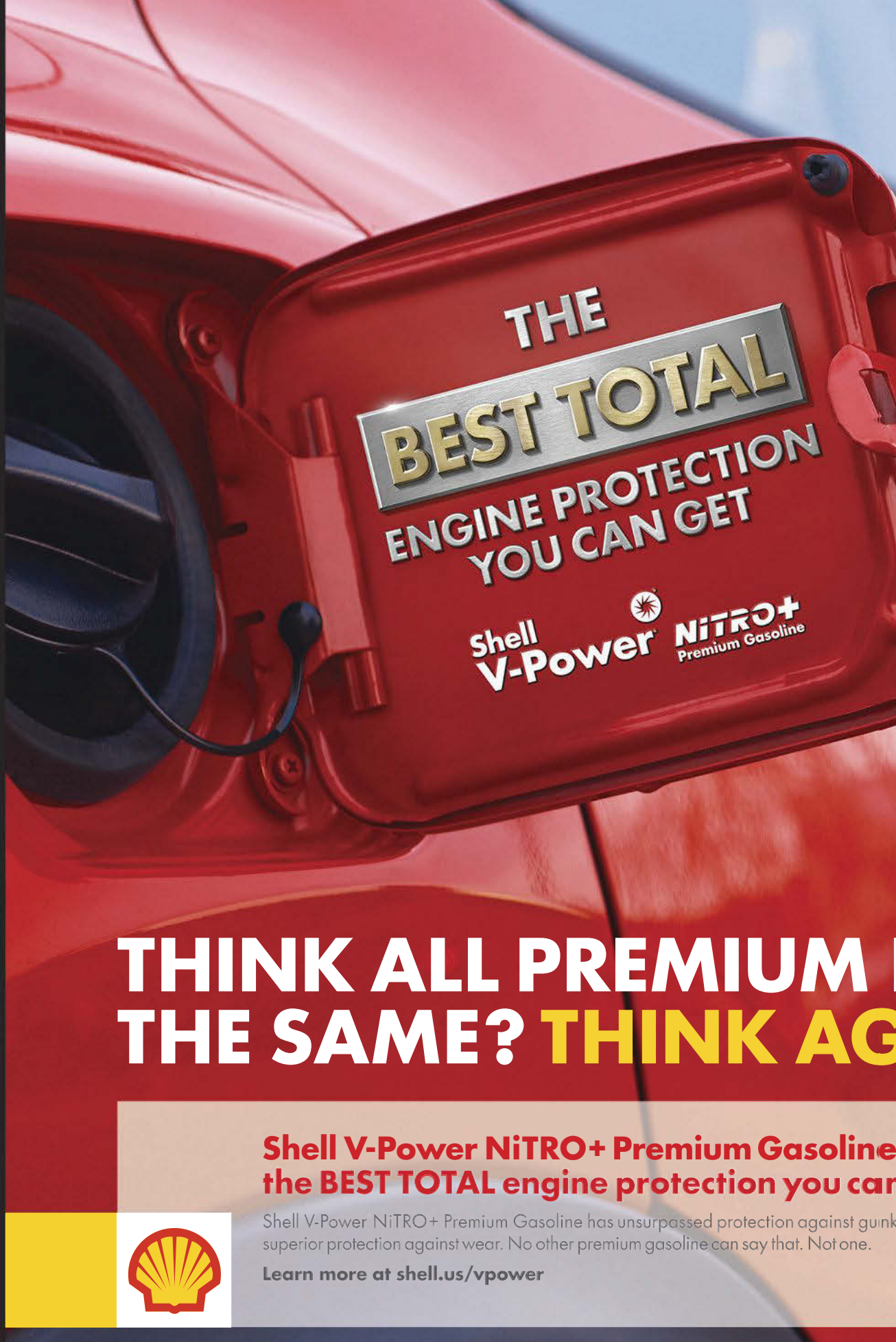

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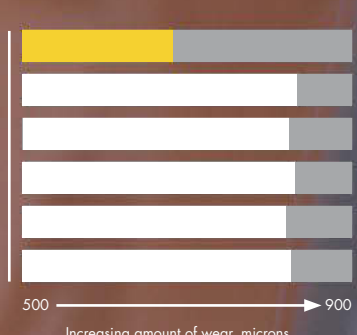
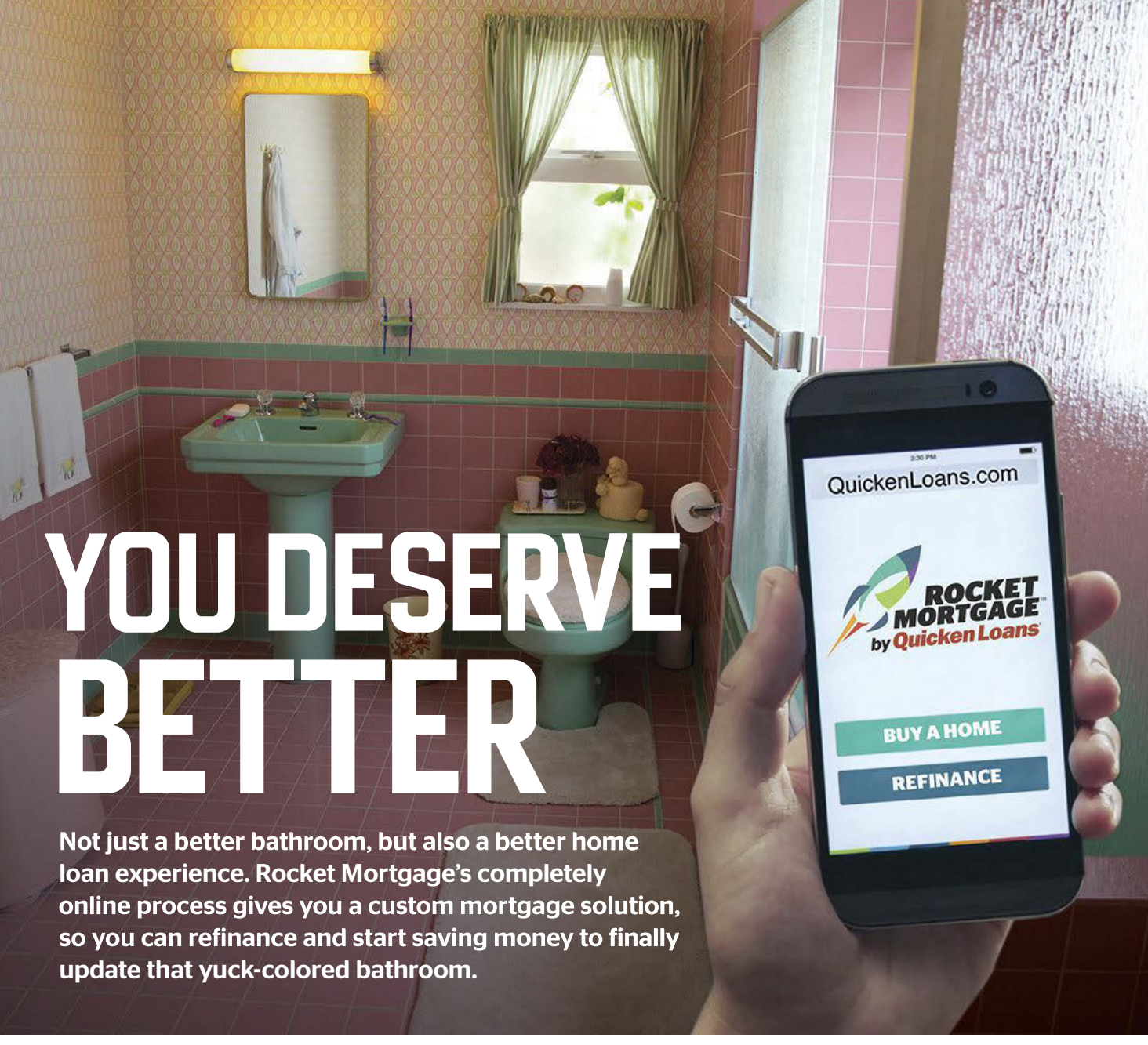


Wear results obtained using gasoline-modified HFRR ASTM D6079.



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Car and Driver. vol. 62, no. 1

Features

036
Exclusive First Drive
2017 CHEVROLET CORVETTE GRAND SPORT
Once a race car, then a special edition, the Grand Sport has become the Corvette's top-selling trim. After a drive in the C7 version, we understand why.
by Daniel Pund

042
Comparison Test
ELEMENTARY
Chevrolet Cruze LT, Honda Civic EX, Hyundai Elantra Limited, Mazda 3 i Grand Touring, Nissan Sentra SL.
by Eric Tingwall

058
Car Meets (Off) Road
2017 BENTLEY BENTAYGA
To an off-road paradise in an on-road hedonist.
by Jared Gall

064
First Drive
BMW M4 GTS
The Werkes forges its hottest track car with a little help from a cooling injection of water.
by K.C. Colwell

070
Feature
LET IT BURN
How quickly can we drive through a tank of gas? We stage a three-way battle for depletory supremacy.
by Jeff Sabatini

On the Cover
Factory-fettled, track-ready sports coupes.
photography by Greg Pajo

In this Issue:

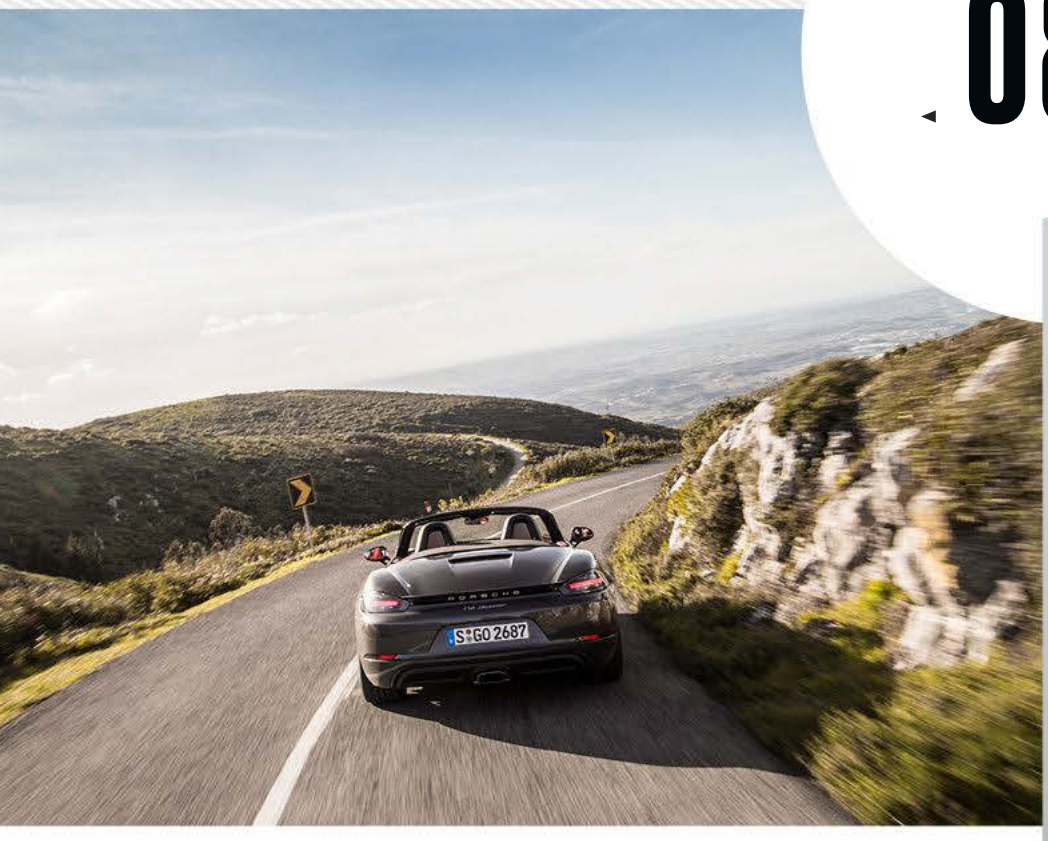
"So we challenged Bentley: If the Bentayga actually has off-road chops, prove it. Let us take one to Moab's Easter Jeep Safari."

—JARED GALL, "BENTLEY ON THE ROCKS"

058

Car and Driver.
vol. 62, no. 1

082



Departments

Columnists

Our columnists take on low emissions with high enthusiasm.

010 . **EDDIE ALTERMAN**
Elon Musk's real endgame.

030 . **JOHN PHILLIPS**
Why shouldn't race cars run clean?

032 . **AARON ROBINSON**
Formula E is a ballet with a lousy soundtrack.

034 . **EZRA DYER**
An engine defines a car.

—

Upfront

019 . *Reveal of the Month*
GLEAMING THE CUBE
Welcome to the redesigned *Car and Driver.*

020 . **THE GAME OF LIFE: CHRYSLER EDITION**
Play along as Chrysler creeps toward another cliffhanger.

022 . *Wheelmen*
RUNNIN' WITH THE DEVIL
Eddie Van Halen shreds tires, too.

024 . **SAFE BETS**
Which vehicles hold their value best? And which are total depreciation disasters?

026 . **NO ASSEMBLY REQUIRED**
A new kit-car law could spawn a repli-mod industry.

028 . **BODY SCANNERS**
Why human-body modeling is the future of automotive safety.

—

Drivelines

082 . **2017 PORSCHE 718 BOXSTER**
More power, less magic.

086 . *Tested* **PORSCHE BOXSTER SPYDER**
The last of the naturally aspirated Boxsters. It will be missed.

092 . *Tested* **CHEVROLET CAMARO LT 2.0T**
Living in the shadow of the V-6.

094 . **2017 JAGUAR F-PACE**
Pace, space, etc.

096 . **2017 VOLVO V60 POLESTAR**
Reinforcing the fleet family freighter.

098 . **2017 MERCEDES-BENZ S-CLASS CABRIOLET**
Opulence, now without a roof.

100 . *Tested* **2017 KIA SPORTAGE SX TURBO AWD**
Bugeye is spritely.

—

Etc.

007 . **BACKFIRES**
So Jackson Pollock, Nygård Lünd, and the Pope walk into a bar . . .

106 . **HOW WE SEE IT:**
Autonomy.

Car and Driver Podcast

—

THE REVIEWS ARE IN: "Just listened to the newest *Car and Driver* podcast. It's concise, it's informative, and it has clearly reputable speakers. I think it's great." — harrisonG

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Backfires:

The proper definition of a man is an animal that writes letters.
—Lewis Carroll

PROPELLERHEADS

Reading your story on BMW's M2 ["Pouring It On," April 2016] made me feel that BMW may finally begin to rectify its recent reputation as the "Ultimate Flaccid Machine." Audi has been beating it at every turn, until now. By returning to its roots, BMW now challenges *C/D* to the ultimate comparison: M2 versus Audi S3. Ed., what are you waiting for?

—Greg Wolley
Portland, OR

Retirement—Ed.

So you guys got the chance to drive the amazing new M2, yet seemingly spent most of your time behind the wheel enthusing over State Route 190 and entertaining wandering thoughts about the 1-series M and the Porsche Cayman. That's like obsessing over the restaurant décor and an old high-school ex while on a dinner date with a smokin'-hot girl!

—Dixon M. Ho
Ottawa, ON

Like you'd know, Ho—Ed.

FAMILY AFFAIR

I was both pleased and disappointed by the results of your "California Dreaming" sedan comparo [April 2016]. Pleased because a "domestic" brand scored better than the highly vaunted and 10Best-winning Honda Accord. Quite an achievement, that. Disappointed because the Accord, which I have repeatedly recommended to friends and family for years, finished a distant third out of four. My disappointment was somewhat assuaged: When considering your rating categories that mean the most to me, the Honda finished second to the Mazda 6.

I did not see in the comparison test where Aaron Robinson indicates what, if any, other transmissions are available on the non-Honda contenders. I have noted this in other *C/D* comparos.

NEW CHEVY MALIBU VS. THE ESTABLISHMENT
CAR AND DRIVER
APRIL 2016
INTELLIGENCE. INDEPENDENCE. IRREVERENCE.
BMW M2
HOLD ON TO YOUR SPLEEN! IT'S...
MUNICH'S MINIATURE MONSTER
AND A SIX-SPEED MANUAL IS STANDARD!
PLUS
ALL-NEW CADILLAC CT6
DRIVEN: BUICK CASCADA, JAGUAR F-PACE, MERCEDES-AMG GLS, VW BEETLE DUNE

"BMW MAY FINALLY BEGIN TO RECTIFY ITS RECENT REPUTATION AS THE 'ULTIMATE FLACCID MACHINE.'"

◄

As someone who never learned to drive an automatic, the availability of a three-pedal manual is a critical criterion in my vehicle-selection process. I suspect other *C/D* readers may share my deficiency.

—Victor M. Lucariello
Archuleta County, CO

The 6 and the Accord can be had with six-speed manual transmissions; the Chevy Malibu and the Toyota Camry are automatic only—Ed.

In the "California Dreaming" article, the team scores the Malibu higher than the Accord. This is the best country in the world, and I think patriotism is a good thing. But there needs to be some automatic points against U.S. autos for the inevitable quality issues that will show up downstream. Remember how every car magazine said that the new Chevy Corvette was the best car ever? And then a year later every magazine is reporting about the overheating problems, the A/C problems, the electrical glitches, etc. When comparing cars, ask yourself: Which car would I recommend to my siblings or parents? Nobody is telling their family to buy a Malibu over an Accord.

—Darrin Zankl
Tampa, FL

Thanks for an excellent comparo of cars that the average family guy like me can actually buy. A longtime Mazda man, I have been as per-

plexed as you about the 6's dismal sales until I had a eureka moment reading the article. It is not just the Accord's and Camry's excellence that stand in the way, it is also the Mazda 3's. The same engine, good looks, and driving dynamics in a lighter package with (predictably) better fuel economy and only a small penalty in interior space. Why upgrade to the 6 in the first place?

—Guillaume Gavillet
San Francisco, CA

You may have a point, Gavillet. Last year, U.S. sales of the Mazda 3 totaled 107,885 while the 6 sold 57,897—Ed.

You are wrong, the Accord wins. It has the most mass.

—The Pope
Vatican City

It's a miracle I'm running this letter—Ed.

CADILLAC'S CORE

I was reading your article about the Cadillac CT6 ["Double Agent," April 2016], and you noted an instrument cluster that has fake dials, as many cars have now. I've seen some manufacturers customize the dash when engaging sport mode, but what about things like larger numbers or increased contrast for older drivers? Are manufacturers taking advantage of the opportunity?

—Mark Secunda
Silver Spring, MD

See "Explained."

I object to your editor castigating Cadillac for keeping the XTS around. Maybe, just maybe, there are enough of us "oldies" who like an easy-riding car decked out in our brand of luxury and with the ability to fit four golf bags. You want Cadillac to continue to become a brand that no one buys? My definition of luxury, and I bet a lot of others', appears different from yours. If Cadillac continues to make money with the XTS, why is it your business to tell them to dump it?

—David Nightingale
Brooklyn Park, MN

APRICOT SCRUBS

While the vast majority of letter writers caught on to our April Fools' joke, a few missed it. For those, please try again next year—Ed.

I like to believe that *Car and Driver* is read by smart car enthusiasts. Surely I'll be once again proven wrong when the letters on "Growing the Super Gold Future" [April 2016] show up in print.

—J. Caulk
Greenville, PA

Your April 2016 piece on Nygård Lünd's apricot-fueled car was right to suggest this technology is vaporware. The problem is that food crops convert sunlight to calories at less than 1-percent average efficiency (see, e.g., N. Lewis, D. Nocera, "Powering the planet: Chemical challenges in solar energy utilization," Proc. Nat. Acad. of Science, Oct. 24, 2006, vol. 103, no. 43, 15729-15735). The amount of land you'd need to satisfy the global transportation energy demand with any biofuel is astounding. Put another way, if you want to power the cars of the future with apricots, I hope you don't mind starving the humans that they transport. Using low-carbon electricity to power cars with synthetically

road test
Double Agent
THE SPORTS SEDAN THAT'S CLEVERLY DISGUISED AS A LUXURY CAR.
by Jeff Sabatini
CADILLAC CT6 PLATINUM AWD

"MAYBE, JUST MAYBE, THERE ARE ENOUGH OF US 'OLDIES' WHO LIKE AN EASY-RIDING CAR DECKED OUT IN OUR BRAND OF LUXURY AND WITH THE ABILITY TO FIT FOUR GOLF BAGS."

Explained: Thin-Film Transistor Display

Audi's display can be configured to show small gauges and a detailed map.

Cadillac's offers a simple speed display with Night Vision object detection.

In a TFT—or thin-film transistor—display, a tiny transistor controls each pixel and the color it emits. TFTs are able to quickly switch the colors put out by the pixel, which makes for realistic images and motion. Pack in a lot of the pixels and you'll get a high-definition display, such as the ones used by Audi, BMW, Cadillac, Jaguar, Lamborghini, Land Rover, McLaren, and Mercedes-Benz. Each manufacturer that uses a TFT display instead of real gauges provides multiple configurations, from simplified numerical digits that might please older drivers to multiple analog-gauge designs that correspond to different driving modes. Carmakers also make it possible to display map, navigation, and trip-computer data. According to Audi, one of the major challenges of the virtual gauges is getting the sweep and the shadowing of the gauge needles to look real, but the TFT's quick response and its ability to accurately render can make the fake look eerily real—*Ed.*

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produced gasoline and diesel, Li-ion batteries, or hydrogen fuel cells would be far better choices.

—John Stevens, Ph.D.
Berkeley, CA

C/D, *1; UC system, 0*
—Ed.

Who is this guy anyway? I tried to Google him and got nothing but obits from Norway. This *was* in the April issue, so I am thinking April Fools.

—John M. Uhelski
Computerland

I just finished the article on Nygård Lünd, and I have no idea what it's supposed to be about. Chocolate cars? The apricot industry? A rich dorkwad walking around in his robe with a smirk on his face?

A minivan test would've been more interesting and made more sense.

—M. Booth
Galt, CA

Who would have thought that the likes of Pearley and Nygård could have produced a sentence that will likely remain unsurpassed in the annals of car magazines: "The energy to power his car is stored in genetically engineered hybrid versions of the South African Super Gold apricot." Is this poetry or physics? What's the difference? Who cares? Can I stop laughing now?

—Steve Hecht
Santa Fe, NM

Sports Illustrated, April 1, 1985, issue. George Plimpton. Love it. Nice work. Did anyone else notice the similarities?

—J. Severson
Montgomery, NY

Oh, man, you had me. I was about halfway through the article, mumbling to myself semi-unintelligible phrases like "what-thecrap" and "cyanide pits, what?" when I got up from the throne and looked at the cover. Hmm. April. Ha! *April!* Oh, you guys really dug deep for that one. That was the best April Fools' joke ever. And to think I almost believed it. Apricots. Ha-ha!

—Cord Guthrie
Prairie Grove, AR

You had me! I was sitting on the throne reading how apricots will power the car of the future when I

"WHO IS THIS GUY ANYWAY? I TRIED TO GOOGLE HIM AND GOT NOTHING BUT OBITS FROM NORWAY."

▼

Editor's Letter:

The new, somewhat-affordable Tesla Model 3—here in just two years' time! Put down your deposit now!—should open up a new triumphalist chapter in the company's hagiography. It ought to bring Tesla's disruptive EV and automated-driving technology to a broader swath of the driving public. Maybe. By then, Tesla's cars could very well be done. Exanimate. Kaput. And other terms for dead.

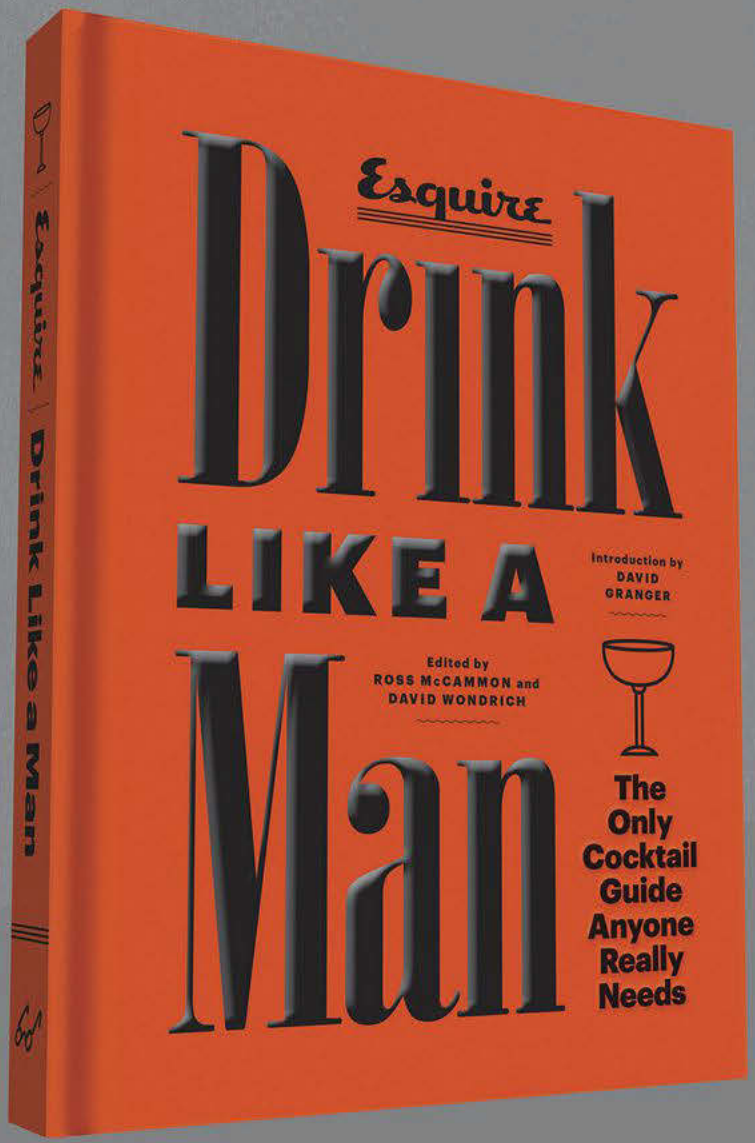
Until now, Tesla has been the only carmaker to understand that most drivers care more about style and performance than about what's under the hood. Elon Musk has given the world sporting machines that are stylish, fast, nimble, and quiet as tombs, with an added sprinkling of holier-than-thou. But if recent reveals are anything to go by, Porsche and GM, among others, have started to figure out that EVs can be more than just $40,000 CARB-compliant cars with less than 100 miles of range. And when these giants bring their everyday-practical EVs to market, they will relegate Musk's cars to curiosities for future generations to study and admire.

Why? Because who would opt for a Tesla when you can get an equivalent Porsche, one that can be bought and serviced in any state? What is Musk's advantage in the face of established brands? The early adopters have already early adopted. The EV mainstream will require mainstream retailing, service, and credibility.

Musk knows this. Which may be why he has lately eased off in his fight with the dealer lobby. What Musk really wants you to buy aren't his cars but his concept of the EV. Commercialization of the technology, not the vehicles themselves, has always been his long game. He wants people hooked on EVs—any EV—as long as his Gigafactory is making the batteries and his pipeline is supplying the electrons. Musk's cars should be seen as marketing for Musk's utilities. The cars he can let go. And let go he will, by which time Tesla will be competing not with GM or Porsche but with ExxonMobil and BP. Even harder than creating a successful car company is creating a new utility. But he's going to do both.

—Eddie Alterman

Looking for a damn good drink?



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realized, midway through the article, that this must be the April Fools' feature I have looked forward to after many years of reading *Car and Driver*. I nearly laughed my ass off the toilet! Thanks, guys.

—David Baker
Hoover, AL

April Fools. Ain't that a peach.

—Mark Tuttle
Salem, MA

You guys suck! I read the recent article "Growing the Super Gold Future" in the April issue with rapt attention to the possibilities that exist with this new technology. The next day I investigated the futures market in South African Super Gold apricots just knowing the demand would skyrocket once Lünd's new technology became marketable.

I shifted a major portion of my 401(k) into SASG apricot futures knowing I'd make a killing. I contacted my son to explain the brilliant financial move I had made. Unfortunately, he pointed out that *Car and Driver* is known to print an April Fools' article.

Like I said . . . you guys suck!

—C. Williamson
Mechanicsville, VA

John Pearley Huffman's feature on Nygård Lünd was giving me Forest Whitaker eye until I remembered what month was coming up. Well done, sir.

—Jeron Prior
Bakersfield, CA

I've been trying to figure out which is the April Fools' article in the last issue. Is it the mysterious Norwegian billionaire who's designing a car powered by an ingredient in a dried fruit bowl, or that a Chevy Malibu beat a Honda Accord in a comparison test?

—Scott Abrams
Belmont, MA

CAPITAL G

You would think a vehicle that has a base price of $218,825 [Mercedes-AMG G65] would be fully equipped (except for Porsche, perhaps), but your price as tested was $3100 higher [Drivelines, April 2016]. What extra for three grand was added on? And I was disappointed to learn there is no room under the hood for a V-16.

—Barry Perlman
Oshkosh, WI

Rear-seat entertainment, all-season floor mats, and a heated steering wheel—Ed.

Regarding the Mercedes-AMG G65 test in the April issue: A V-12 in a vehicle whose roadholding number is less than its track width in inches . . . talk about wasting good Scotch!

—Pierre Brown
Burlington, ON

VISTA POINTS

Wow! I love what I see and read about the Buick Avista concept car ["Hasta Avista," April 2016]. I pray that Buick-GMC's Duncan Aldred will make this concept car a reality. It is a stunning beauty of a two-door coupe, inside and out. Please tell him I'll be first in line; the same deep-blue body and powder-blue calipers, too.

—Les Henson
Wildomar, CA

Aston/Jaguar looks, 400 horses, and the latest tech. Wow! I do understand the Avista's a show car, but the last time a Buick stirred me like this I was a kid admiring late '60s and early '70s Rivieras. While Buick has had some interesting cars since, for the most part they've left me

SCRUTINEERING

015

upfront

edited by JARED GALL

AVISTAR — The verb "avistar" means "to catch sight of" or "to glimpse" in Spanish. Americans know it as part of the Terminator's sendoff for T-1000. Depending on context, "hasta la vista" can either mean "bye" or "until we meet again."

REVEAL OF THE MONTH

Hasta Avista

BUICK'S DETROIT SHOW CONCEPT FACES JUDGMENT DAY.

by Jared Gall

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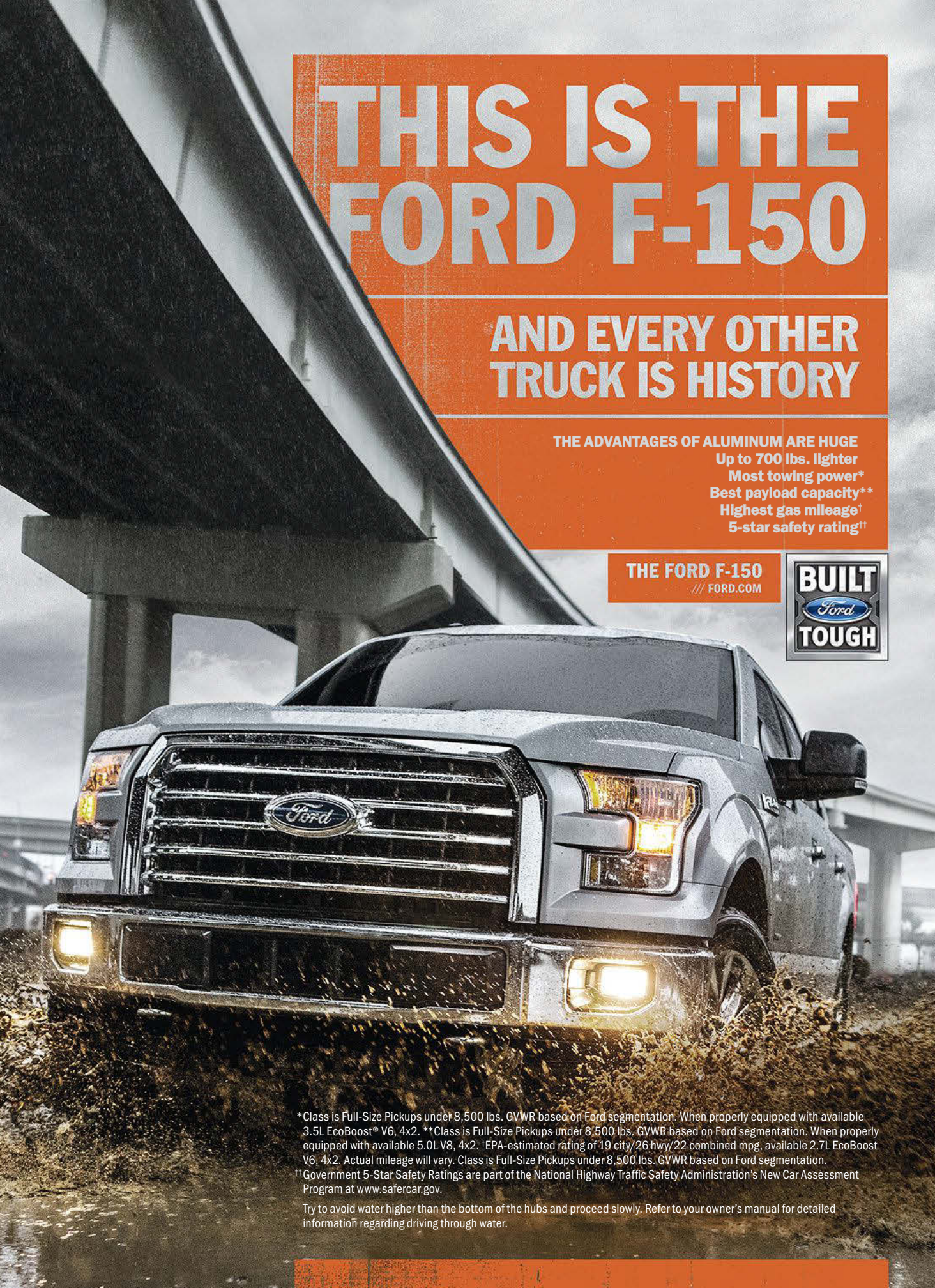
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lukewarm, and I've always considered the brand rather passionless. This car would be a game changer. If it set the styling tone for all new Buicks cohesively, like what has occurred at Cadillac, I believe the brand would experience a renaissance the likes of which GM couldn't imagine. Just keep the costs in check so the cars, even the top models, are within reach and not at the five-figure portal like the fine-but-pricey cars from Cadillac.

—Alan Snyder
Orange, CA

POWERFUL GRAPHICS

Jared Gall's piece illustrating the comparative cost of increased power ["The Price of Power," April 2016] caused me considerable eye strain. I was torn between deciphering some interesting information and thinking, why couldn't they have laid this out in an easier-to-read fashion? But when I showed the article to the "research professionals" where I am employed, they stuck up for the graphic, noting that there was a heck of a lot of detailed information conveyed. I remain grateful to Mr. Gall and the rest of your crew for not putting it all on one page.

—Bart Stringham
Bethesda, MD

With regard to the illustration in your April Upfront article "The Price of Power," all I can say is Whiskey Tango Foxtrot.

—Bill Taglia
Southington, CT

Please let me know if you need more charts.

—J. Pollock
Springs, NY

AROUND THE CORNER

Out here in rural Wisconsin, the advisory speed limits seem designed to accommodate someone's grandpa driving a Ford Model T on ice ["This is Not a Made-Up Number," April 2016]. Needless to say there are many lawbreakers out here as a result.

—Art Naebig
La Valle, WI

My daughter, approaching driving age several years ago, asked how speeds in curves were determined. I told her that DOT workers put their coffee mugs on the dashboard of their dump trucks, and the fastest that a turn can be taken without the mug sliding off the dash is the speed posted for that particular curve. She initially thought I was pulling her leg, though later as she got more driving experience, she agreed with my logic. That seems to be about as good a method as the ones in your article.

—J. Wayne Gallman
Spartanburg, SC

I've always wondered, is it legal to exceed the speed posted on an advisory cornering-speed sign? Can police write tickets for that? What about taking the corner at no more than the straight speed limit before the curve? Advice would be appreciated. Thanks.

—Michael M. Melton
Las Cruces, NM

It is legal, but police might write you a ticket if your speed seems excessive to them—Ed.

DOGTOWN

If you don't want your dog sticking his head out the window ["Sit, Stay, Corner," April 2016], you can open the vent to the outside and the dog will still enjoy many scents from outside as you travel.

—Anne Peticolas
Austin, TX

Doggles are a wonderful protection for window warriors, not only against flying gravel, but also against the ravages that can be caused by

Letter of the Month:

At first I was like, "Huh?" but then I was like, "Huh!"

—John Ratz
Stratford, ON

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repeated exposure to 50-mph winds. The Doggles-brand goggles are very effective, easy to fit, and come highly recommended by McKay and Harris, our well-traveled Australian shepherds.

—Eric Somers
Dundas, ON

The idea that wolves simply "enjoy going places" sounds a bit like urban romanticism to me. Play, gambol, run; certainly, these are intelligent creatures that exhibit a wide range of behavior. But wild animals are constantly doing a cost-benefit analysis of their activities, and the less you have to travel to eat, the better off you are. The crowded environments Dr. Hare refers to may force wolves to travel long distances, but it's not by choice, so why would enjoyment of travel be evolutionary programming?

—Charlie McLaren
Whitehorse, YT

HIGH TIMES

Congrats to Robinson on taking up wings ["My Next Toy Will Have a Barf Bag," April 2016]. If he thought the aviation version of "stall" was "far more exciting," I can't wait to hear his take on "spin."

—Jim Keenan
Vista, CA

SEEING RED

Did *C/D* really find it necessary to publish an article on racers' political leanings ["Why Do Racers Vote Republican?" April 2016] in a world nauseatingly awash in political tirades? I'm not concerned with the drivers' politics, beliefs, or the like, only with how they pursue their craft. That said, coverage of any sexually deviant behavior displayed by the drivers might prove to be very interesting fodder for future issues.

—Dave Misun
Kenosha, WI

Peter Manso is the worst writer and biggest prick to appear in your pages since Yates retired and Davis died. I'd have rather read another ad.

—John Robinson
Salem, OR

As a longtime subscriber (since *Sports Cars Illustrated*), I have never been motivated to write to the editor. The recent column by Peter Manso extolling the virtues of the rugged-individualist, conservative-minded racer really got my goat. Racers, at least the big-time ones, exhibit the traits of the most leftist liberal ever—they spend other people's money.

—Joel Condit
Las Vegas, NV

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Reveal of the Month

GLEAMING THE CUBE

WELCOME TO THE REDESIGNED *CAR AND DRIVER*.

SALUTATIONS, READER. You look a little different. Have you been working out? Just eating more? Maybe you had cat-whisker implants or gender-reassignment surgery? You might have noticed that we, too, look different, and it's not entirely due to the shellfish buffet on the Jaguar F-Pace launch [see page 094]. Like the automakers, we like to update our look and content to keep things fresh and improve the presentation of information.

In addition to new fonts, layouts, and page furniture, the model-year 2016.5 *Car and Driver* improves its passing time by 0.2 second compared with the outgoing model. You'll find a back-page essay that takes the place of the "What I'd Do Differently" interview that has been there since August 2009. This new feature will sporadically sub in for WIDD on the occasions when nobody intriguing will pick up the phone.

You'll also notice in the Bentley Bentayga's road-test spec panel [see page 058] that we replaced the comparative bar graphs with spider charts that pack more information into, well, more space. But information per square inch is up, in response to a bunch of mail complaining that our charts were just too doggone penetrable.

We now list EPA combined fuel economy, finally, and among other things that we'll let the most devoted readers find on their own, we've reconsidered our categorization of four-wheel-drive and all-wheel-drive systems. If it has a center differential or a coupling that mimics one, we'll call it all-wheel drive. If it routes torque to all four wheels without a center diff, it's four-wheel drive. That we made this change in the same issue as our off-road adventure in a Bentayga is purely coincidental. It turns out you can three-wheel a Bentley no matter what you call its drivetrain. And that's what is most important about this new look. It's generated by the same band of lunatics adhering to the same creed:

Intelligence. Independence. Irreverence.

photography by JOHN ROE

THE GAME OF LIFE: CHRYSLER EDITION

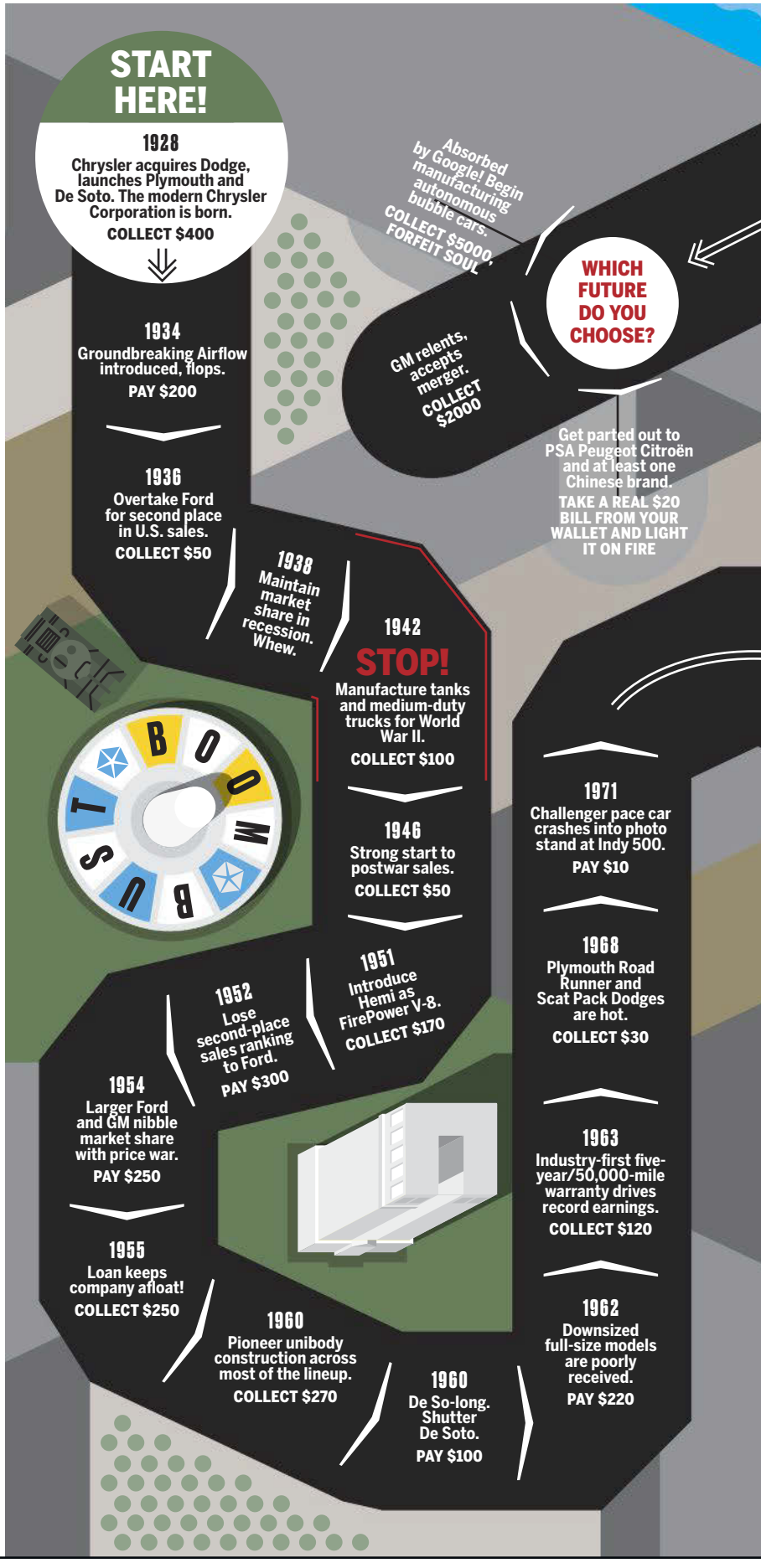
PLAY ALONG AS CHRYSLER CREEPS TOWARD ANOTHER CLIFFHANGER. *by Jared Gall*

CHRYSLER'S GOVERNMENT BAILOUT and subsequent rescue at the hands of Fiat in 2009 wasn't the first time the company teetered on the edge of extinction. It wasn't even the second. The brand's long flirtation with insolvency dates all the way back to 1955, when then-president L.L. "Tex" Colbert saved the company by securing a loan of a quarter-billion dollars from Prudential Insurance. In today's dollars, that's more than $2 billion. Since then, the company has oscillated between boom and bust at a higher frequency than most of its contemporaries.

Where it is in that cycle today will only become clear in time, but CEO Sergio Marchionne's aggressive courtship of another partner suggests that he sees trouble ahead. He's stated publicly that, going forward, automakers will need to sell at least 6 million units a year to survive. FCA's sales total last year? Just 4.6 million.

What FCA has to offer is plenty. The Jeep brand is on fire, and Maserati is building global momentum. But FCA's recent reversal on its requirement that dealers operate stand-alone showrooms suggests that the Fiat rebirth is wavering. Alfa Romeo is struggling. And now that Marchionne has sold Ferrari—without whose proceeds FCA's per-unit profit last year worked out to just $21—we're left with a Chrysler that is structurally different from the one that nearly went bankrupt seven years ago, but it faces some of the same challenges.

Is Chrysler staring into the abyss once again? To make sense of the present and better predict the future while having a little fun, let's retrace the steps that brought Walter P.'s enterprise to where it is today. Grab some dice, playing pieces, a stack of board-game money, and a Sharpie for adding zeros (the automotive industry is a seriously big-dollar business), and play along.



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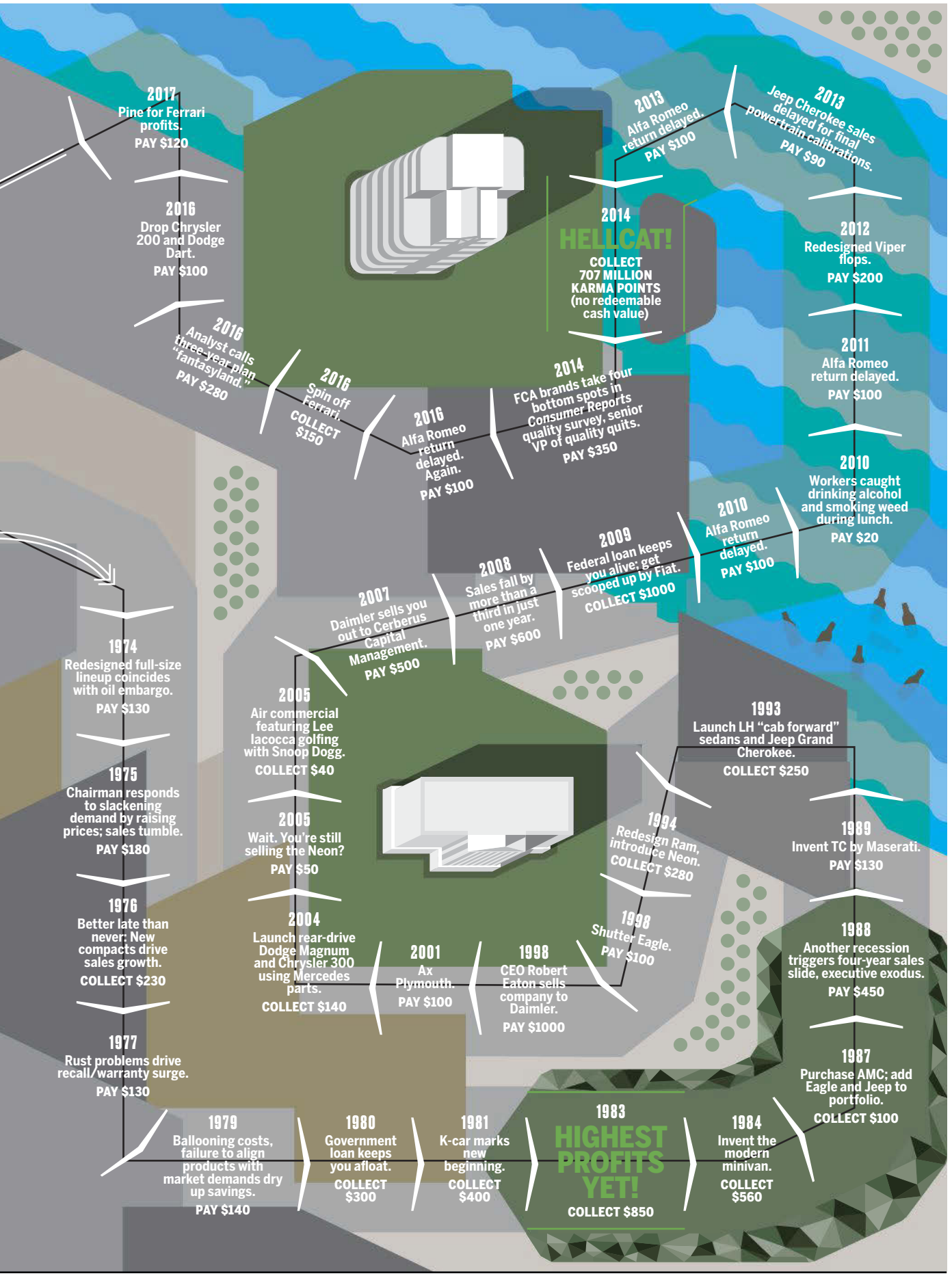

2017
Pine for Ferrari profits.
PAY $120
2016
Drop Chrysler 200 and Dodge Dart.
PAY $100
2016
Analyst calls three-year plan "fantasyland."
PAY $280
2016
Spin off Ferrari.
COLLECT $150
2016
Alfa Romeo return delayed. Again.
PAY $100
2014
FCA brands take four bottom spots in Consumer Reports quality survey, senior VP of quality quits.
PAY $350
2014
HELLCAT!
COLLECT 707 MILLION KARMA POINTS (no redeemable cash value)
2013
Alfa Romeo return delayed.
PAY $100
2013
Jeep Cherokee sales delayed for final powertrain calibrations.
PAY $90
2012
Redesigned Viper flops.
PAY $200
2011
Alfa Romeo return delayed.
PAY $100
2010
Workers caught drinking alcohol and smoking weed during lunch.
PAY $20
2010
Alfa Romeo return delayed.
PAY $100
2009
Federal loan keeps you alive; get scooped up by Fiat.
COLLECT $1000
2008
Sales fall by more than a third in just one year.
PAY $600
2007
Daimler sells you out to Cerberus Capital Management.
PAY $500
1974
Redesigned full-size lineup coincides with oil embargo.
PAY $130
1975
Chairman responds to slackening demand by raising prices; sales tumble.
PAY $180
1976
Better late than never: New compacts drive sales growth.
COLLECT $230
1977
Rust problems drive recall/warranty surge.
PAY $130
1979
Ballooning costs, failure to align products with market demands dry up savings.
PAY $140
1980
Government loan keeps you afloat.
COLLECT $300
1981
K-car marks new beginning.
COLLECT $400
1983
HIGHEST PROFITS YET!
COLLECT $850
1984
Invent the modern minivan.
COLLECT $560
1987
Purchase AMC; add Eagle and Jeep to portfolio.
COLLECT $100
1988
Another recession triggers four-year sales slide, executive exodus.
PAY $450
1989
Invent TC by Maserati.
PAY $130
1993
Launch LH "cab forward" sedans and Jeep Grand Cherokee.
COLLECT $250
1994
Redesign Ram, introduce Neon.
COLLECT $280
1998
Shutter Eagle.
PAY $100
1998
CEO Robert Eaton sells company to Daimler.
PAY $1000
2001
Ax Plymouth.
PAY $100
2004
Launch rear-drive Dodge Magnum and Chrysler 300 using Mercedes parts.
COLLECT $140
2005
Wait. You're still selling the Neon?
PAY $50
2005
Air commercial featuring Lee Iacocca golfing with Snoop Dogg.
COLLECT $40

Wheelmen

RUNNIN' WITH THE DEVIL

EDDIE VAN HALEN SHREDS TIRES, TOO. *by David Curcurito*

LIKE ANY RED-BLOODED KID growing up in Pasadena, California—hometown of that famous little old lady—Eddie Van Halen had a taste for hot cars. After his band's self-titled debut album went platinum in 1978, he cycled through a collection nearly as exceptional as his guitar playing, from a succession of 12-cylinder Lamborghinis and Ferraris to his current favorite, a new Porsche 911 GT3 RS.

C/D: ***Are there any similarities between the stage and the track?***

EVH: Practice, obviously. The adrenaline rush is similar. You're always pushing the edge, on stage live and driving on a track. But improvising at the drop of a hat is the biggest thing. There are no do-overs. If you spin out, you spin out. If you mess up live, you smile your way through it or improvise quick, just like if there's an accident in front of you or somebody's trying to pass you.

6, 8, 10, 12

Van Halen's current collection includes a Lamborghini Miura, a Porsche 911 GT3 RS, and two Audi R8s, a V-8 and a V-10. Both R8s are supercharged and fitted with custom exhaust systems. And then there's a 1947 Dodge flatbed for slow rides.

■ ***Your new 911 GT3 RS, that's a hard-core purist's choice. What do you love about it?***

□ For one, it's just so light. But really, it's the handling. I don't know how Porsche did it. We raced in the rain at Buttonwillow, which is my favorite track. We raced in the fucking rain and we never lost it, never spun out. BBI [Autosport] did my suspension. I set it up so you can feel it go and you can actually slide the damn car. It's the first time ever I've been able to four-wheel-drift a Porsche. Every other Porsche I've ever had, I've spun them all. Well, every 911, anyway.

■ ***What's your most memorable drive?***

□ That's easy. Since I bought the V-8 R8, Audi contacted me and offered for us to go up to Infineon to test-drive the V-10 on the track. You know, just go crazy. So [my wife] Janie and I drove up in her Mercedes-Benz ML63 AMG. It's a long drive and we're doing about 90, 95 in a 65, and I get pulled over and the guy writes me up for a ticket. I'm going, "The last thing I need is a speeding ticket for that much over the speed limit." We get home and I get a letter from my office; the patrol guy who gave me the ticket, his captain voided it. He said, "You don't give Eddie Van Halen a ticket," and I had a letter to prove it. The letter came straight from the captain.

photograph by PEGGY SIROTA/TRUNK ARCHIVE

I CAN WIN
ANY CAR GAME
IN MANUAL OR
AUTOMATIC.
NOT JUST A PRETTY HAIRSTYLE.
SPIKED-UP LOOK
STYLING PUTTY.
AXE
STYLING
ADRENALINE
SPIKED-UP
LOOK
STYLING PUTTY
EXTREME HOLD. LONG-LASTING.
EXTREME HOLD.
LONG-LASTING.
AXE
FIND YOUR MAGIC.

SAFE BETS

WHICH VEHICLES HOLD THEIR VALUE BEST? AND WHICH ARE TOTAL DEPRECIATION DISASTERS? *by Benjamin Preston*

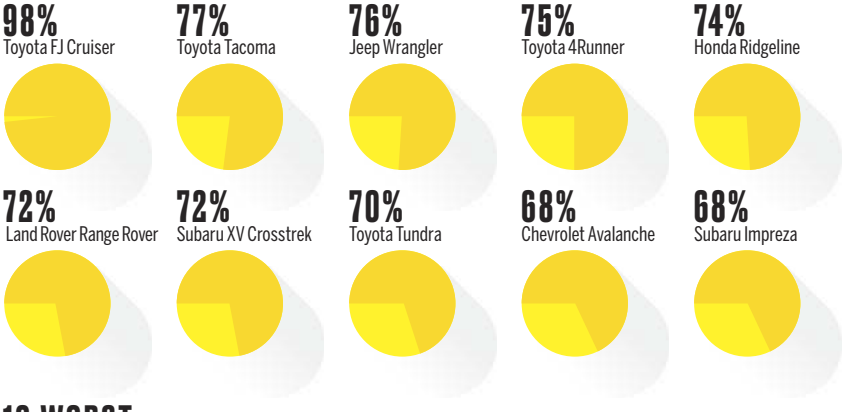
WHAT PART OF OWNING A VEHICLE do you suppose costs the most? Fuel? Taxes and fees? Maintenance? Actually, what costs the most is selling your car, when you take the depreciation hit. Time marches on, miles pile up, and value slips away. On average, vehicles lose almost half their original value within the first three years. The two ways of looking at this figure are depreciation and retained value, i.e., glass half-empty or glass half-full. A vehicle that depreciates 35 percent retains 65 percent of its original value.

53%
Industry-wide average retained value after three years

Of course, not all vehicles depreciate equally. The National Automobile Dealers Association (NADA) tracks trade-in values to gauge which vehicles hold their value best—and worst. The data here depicts the retained values of three-year-old models. It may be just as critical to your buying decision as zero-to-60 times.

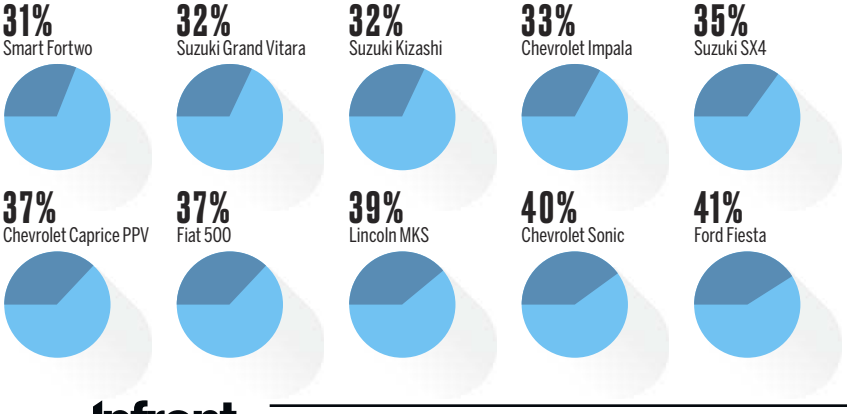
10 BEST

Niche models may not be cash cows for the automakers, but they're excellent opportunities for consumers, particularly if scooped up just before the model gets canceled. Toyota introduced the FJ Cruiser for the 2007 model year, and from 2008 until it was discontinued after 2014, the FJ never broke 15,000 annual sales. Now, the average three-year-old example is worth an astounding 98 percent of its original sale price.



10 WORST

Vehicles that enjoy large sales volumes tend to reward their owners with lower depreciation rates. Unfortunately for buyers of low-volume yet mainstream small cars, especially from discontinued brands, the opposite is also true.



OH, WHAT A FEELING!

THE RETRO-THEMED FJ ISN'T THE ONLY TOYOTA TO SAVE ITS OWNERS MONEY. BY NADA'S ACCOUNTING, SIX OF THE BRAND'S 15 OFFERINGS LEAD THEIR CLASSES IN RETAINED VALUE. THAT'S BETTER THAN ANY OTHER BRAND IN THE COUNTRY. BY CLASS, PICKUPS AND SUVs TEND TO DO WELL. NOTE THAT, IN SOME CASES, NADA'S CLASSIFICATIONS DIFFER FROM THOSE WE NORMALLY USE.

Class high
Class low
Class average

Subcompact car		
Scion xB	61%	
Smart Fortwo	31%	
Average	46%	
Compact car		
Subaru XV Crosstrek	72%	
Suzuki SX4	35%	
Average	51%	
Mid-size car		
Subaru Legacy	63%	
Suzuki Kizashi	32%	
Average	47%	
Large car		
Dodge Charger	55%	
Chevrolet Impala	33%	
Average	45%	
Sports car		
Ford Mustang	61%	
Mini Cooper	50%	
Average	55%	
Compact SUV		
Toyota FJ Cruiser	98%	
Suzuki Grand Vitara	32%	
Average	56%	
Mid-size SUV		
Toyota 4Runner	75%	
Dodge Journey	48%	
Average	58%	
Large SUV		
Toyota Sequoia	67%	
GMC Yukon XL	53%	
Average	56%	
Mid-size pickup		
Toyota Tacoma	77%	
Nissan Frontier	66%	
Average	73%	
Large pickup		
Toyota Tundra	70%	
Nissan Titan	54%	
Average	61%	
Mid-size van		
Toyota Sienna	61%	
Ram Cargo Van	42%	
Average	52%	
Luxury subcompact car		
Volvo C30	54%	
Volkswagen Eos	43%	
Average	48%	
Luxury compact car		
Lexus IS	57%	
Cadillac ATS	42%	
Average	49%	
Luxury mid-size car		
Volvo XC70	63%	
Volvo S80	42%	
Average	49%	
Luxury large car		
Audi A7	59%	
Lincoln MKS	39%	
Average	47%	
Luxury sports car		
Porsche 911	60%	
Jaguar XK	43%	
Average	54%	
Luxury compact SUV		
Acura RDX	59%	
Infiniti EX	45%	
Average	54%	
Luxury mid-size SUV		
Land Rover LR4	67%	
Lincoln MKT	45%	
Average	54%	
Luxury large SUV		
Land Rover Range Rover	72%	
Lincoln Navigator	50%	
Average	57%	

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NO ASSEMBLY REQUIRED

A NEW KIT-CAR LAW COULD SPAWN A REPLI-MOD INDUSTRY. *by Jeff Sabatini*

WOULDN'T IT BE GREAT if the coolest cars in history could go back into production? The currently finite supplies of fragile vintage metal could be augmented by reproductions updated with modern engines and technology. Well, fantasize no longer; a provision in last year's FAST Act highway-funding law lays the groundwork for such a reality.

Originally introduced as the Low Volume Motor Vehicle Manufacturers Act of 2015, the law allows manufacturers to apply for an exemption from NHTSA safety and crash-test standards for up to 325 "replica motor vehicles" annually. These repli-mods will still have to meet current-year emissions standards, which will require new EPA-certified production engines and emissions controls. NHTSA will grant a waiver only to companies building fewer than 5000 vehicles worldwide annually, and the replicas will need to be licensed from the original manufacturer. That last detail is exciting, as it creates a potential profit motive for carmakers to sanction revivals of their most memorable designs.

300

TODAY THE DeLOREAN MOTOR COMPANY IS JUST A RESTORATION SHOP SPECIALIZING IN THE ICONIC GULL-WINGED SPORTS CAR. BY NEXT YEAR, IT COULD BE BUILDING THE FIRST OF 300 REPLICAS WITH MODERN MECHANICALS.

The immediate beneficiary is today's kit-car industry, which will be able to sell turnkey Shelby Cobra clones and Ford hot rods with engines already installed. While that intent is clear, the language concerning what constitutes a replica opens further possibilities. Apart from requiring a new engine, the law merely states that a replica be "intended to resemble the body of another motor vehicle that was manufactured not less than 25 years before."

"That definition is a gray area," admits Stuart Gosswein, senior director, federal government affairs at the Specialty Equipment Market Association (SEMA), which helped draft the legislation. Another issue that remains unresolved by the federal law is how states might change their registration processes for these cars. While SEMA is officially focused on shepherding the law through its initial implementation, others hope the new legislation leads to a cottage industry of specialty-car builders similar to that in Great Britain.

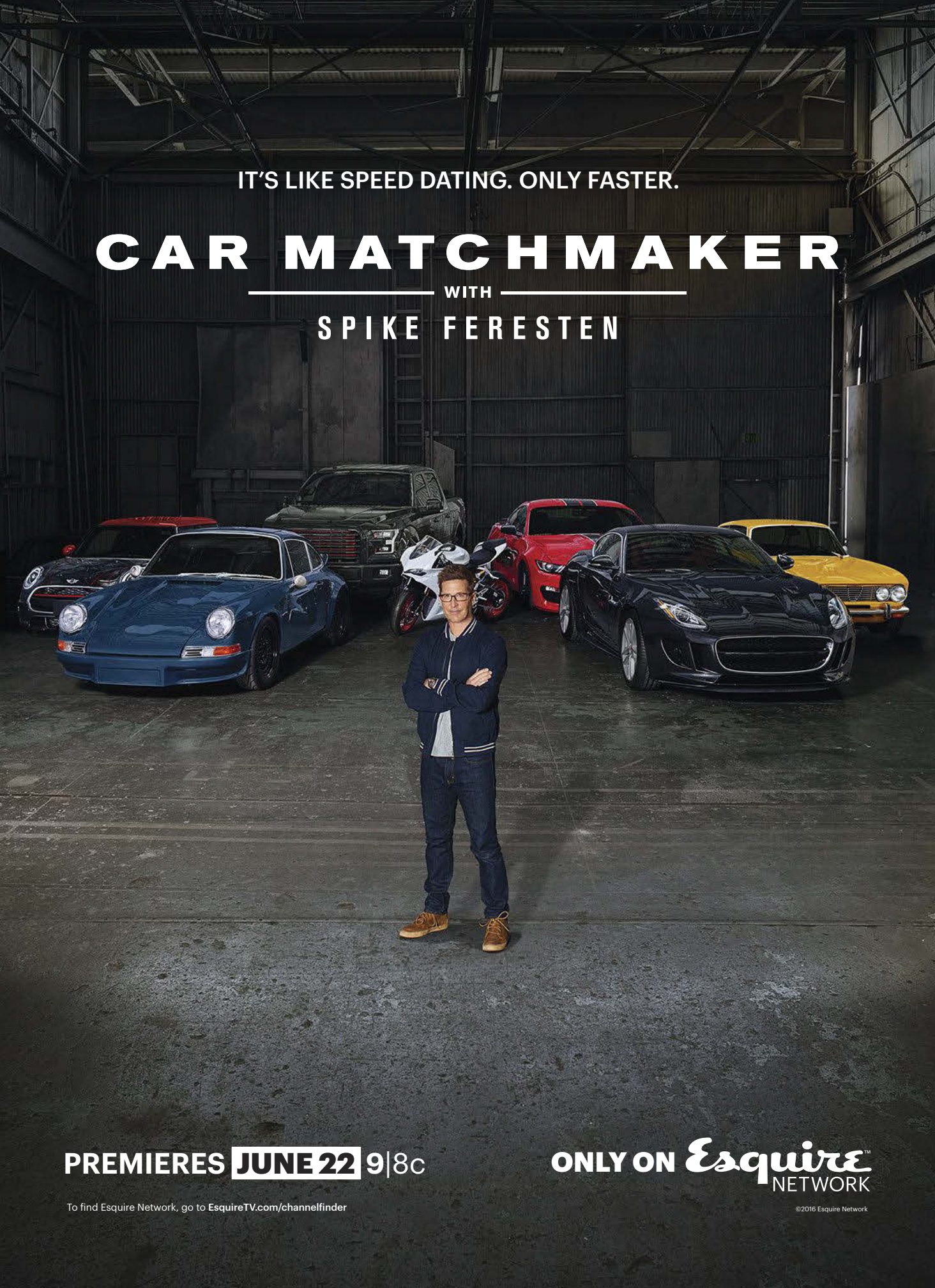
One of the first ventures announced in the wake of the law is a plan to build new DeLoreans. Texas-based DeLorean Motor Company intends to use its cache of millions of new old-stock DMC-12 parts to build 300 copies of the iconic gullwing coupe, with prices in the $80,000-to-$100,000 range. The cars will be upgraded with modern instrumentation and larger wheels and brakes to handle up to 375 horsepower. Vice president James Espey says his company will start production in the spring of 2017, "assuming the EPA and NHTSA stay on point."

The agencies have a December deadline for finalizing rules related to the law, though the industry is still cautious of possible bureaucratic delays. "As we know, NHTSA has a lot of things on its plate," says SEMA's Gosswein.

CHROMECASTING

John Fox, the former body-shop owner behind **Your Car in Diecast** (www.yourcarindiecast.com), defines his business succinctly: "I am a restoration shop in 1/18-scale cars." Send him a die-cast model plus detailed photos of your collector car, and he will transform the toy into an exact miniature reproduction of the real thing. Fox uses resin and polyester body filler to create details such as hood scoops and vinyl roofs. A paint job includes authentic factory formulations, wet sanding, and clear-coat. The cost? About $250. For more-complex projects, go ahead and add another digit to the price—just like a real restoration.

photography by GREG PAJO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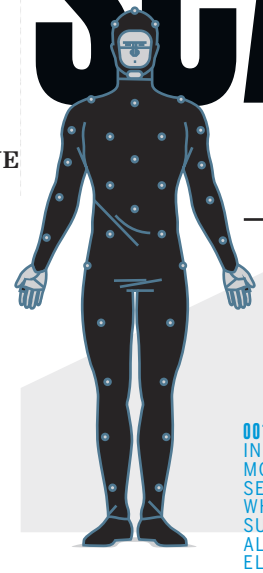
God Shuffled His Feet

BODY SCANNERS

WHY HUMAN-BODY MODELING IS THE FUTURE OF AUTOMOTIVE SAFETY. *by Clifford Atiyeh*



001
IN ADDITION TO MOTION-CAPTURE SENSORS (THE WHITE DOTS), TEST SUBJECTS ARE ALSO WIRED WITH ELECTRODES THAT RECORD MUSCLE CONTRACTIONS.

002
THE CAMERA ARRAY EVEN INCLUDES A PAIR AIMED THROUGH THE SUNROOF.

003
ANOTHER CAMERA POINTS THROUGH A PLASTIC WINDOW IN THE GUTTED DOOR. THIS HELPS FORM A COMPLETE THREE-DIMENSIONAL PICTURE OF PASSENGER MOVEMENT.

ACCELERATE, SMASH, REPEAT. For decades, crash tests were the only way to predict how well a car might protect the people inside. But what happens when safety engineers stretch their bell curves beyond government standards, to grasp those last tenths of a percent of improvement? When dummies are too dumb, human-body modeling takes over.

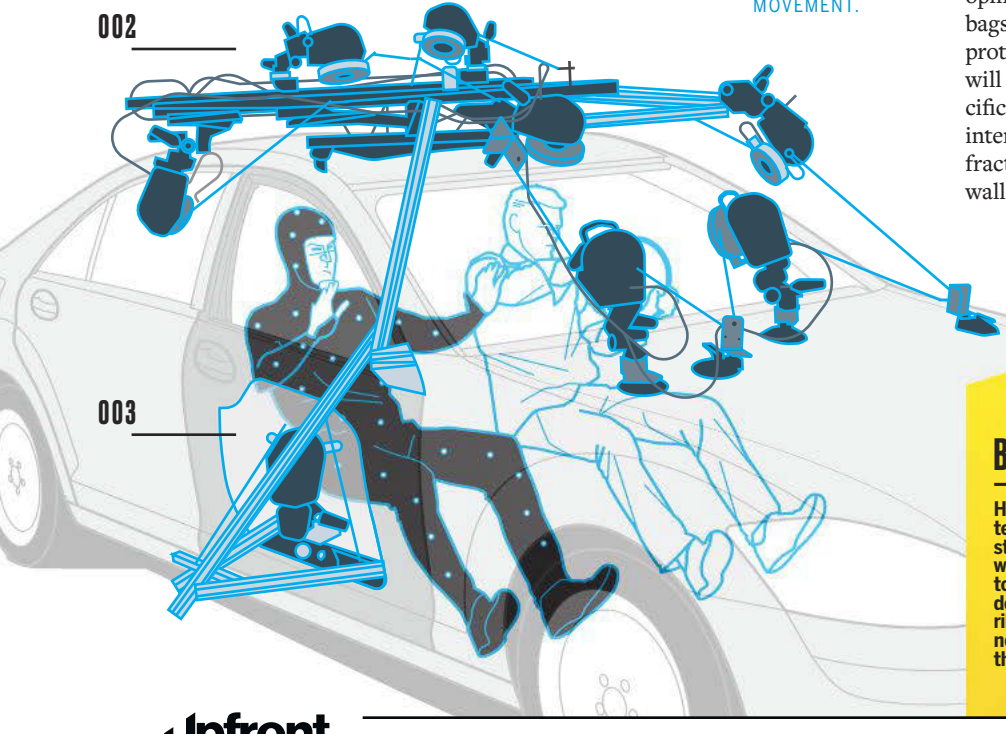
"You see the crash-test dummy leaning out of the window after a crash. That situation has nothing in common with reality," says Dr. Andreas Rieser, who leads a team of mechanical and material engineers at Virtual Vehicle, a research-and-development center in Graz, Austria.

Rieser advises the major German automakers and suppliers, among others, on a people-first approach to designing safety equipment. His partners include BMW, Daimler, Jaguar Land Rover, and Volkswagen, as well as big suppliers such as Bosch, Continental, and Magna. Virtual Vehicle's interest focuses on the seconds before a collision, how people react when they realize an impact is imminent—tensing up, bracing themselves, and shifting in the seat.

The organization has studied body movements of more than 800 passengers. Test subjects, wearing motion-capture suits, get tossed around in three lane-change and braking maneuvers. In the first, the person knows when and how the driver will swerve and stop. In the second, he knows what's happening but not when. The last test is a total surprise. Nine infrared cameras rigged to the exterior of a test car, including some that peer through the door, capture the data.

Back in the lab, researchers replay these recorded scenes over and over. By studying human behavior before and during a crash, body modeling helps automakers fine-tune their safety systems, identifying and preventing additional injuries that are the unintended consequences of other safety features such as smart airbags and pre-collision systems. When a person tenses up before impact, for example, does the pre-tensioner dig the belt too aggressively into his or her shoulders?

Human-body modeling played a key role in Mercedes-Benz's adoption of front-seat bolsters, which move occupants inboard before a side collision, and fueled the development of inflatable seatbelts, knee airbags, and pop-up hoods for pedestrian protection. As the discipline develops, it will enable automakers to delve into specific means of mitigating potential for internal bleeding, organ damage, and bone fractures. Makes smashing a car against a wall seem rather primitive, doesn't it?



BECOMING HUMAN

Human-body modeling won't leave crash-test dummies jobless just yet. As part of stricter model-year 2019 standards, NHTSA wants new ones. Among the many upgrades to the proposed dummies: more accurate detection of brain trauma, spinal injuries, rib deflections, and, with the ability to "nod," neck problems. And in side-impact tests, they'll slouch more naturally in the seat.

illustrations by MARTIN LAKSMAN

THE ALL-NEW
RAV4 HYBRID
HOW FAR WILL YOU TAKE IT
The road to adventure takes many forms, and the all-new RAV4 Hybrid helps you explore it all with class-leading mpg.[1] Toyota's proven hybrid powertrain compromises nothing, serving up more horsepower[2] for thrilling acceleration. And when you need additional traction, the Electronic On-Demand All-Wheel Drive with intelligence (AWD-i) delivers power to the rear wheels. The all-new RAV4 Hybrid: the only choice, whichever adventure you choose.
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TOYOTA
Let's Go Places
Prototype shown with options. Production model may vary. 1. 2016 EPA-estimated 34 city/33 combined mpg for RAV4 Hybrid. AWD-i models only. Actual mileage will vary. 2. When compared to 2016 RAV4 gas models. ©2015 Toyota Motor Sales, U.S.A., Inc.

Not many years ago, I was sitting at a bar with Brock Yates near his Thousand Islands home. We were trying to conjure 10Best topics. I said, "How about the 10 best *C/D* editors who have apparently become insane?"

"Oh, puh-*leese*," Brock said. "Absurd."

"Why?" I asked.

"Because we'd never get the list down to 10 names."

After reading this column, you may want to add me to the list. I'm okay with that.

As we wrote last month, the EPA recently said that, in 2018, it would begin enforcing a scary mandate—that emissions equipment on street-legal cars must remain intact forever, even if the car is used solely on racetracks. Then, in mid-April, the agency backed off, saying that the ban is aimed only at companies selling parts that disable emissions controls, and race cars could continue to be modified in any manner desired. But what I'm asking is, "Why back down?" In this matter, I agree with the EPA's original mandate.

For starters, obtaining monstrous power no longer demands that the engine operate as dirty as a dorm shower. Fiat Chrysler proved that with the 707-hp Hellcats. And in the past, I've driven many hot laps around Mazda Raceway Laguna Seca in Ford Mustang Boss 302s and Subaru WRX STIs, emissions equipment unmolested. Both were faster and more reliable than a TRD-prepped Toyota MR2 Turbo that I raced there in 1992. Also more fun.

In club racing—every category—why shouldn't cars run clean? Maybe not as clean as street cars, but might we set some modest level of emissions cleanliness that the sanctioning bodies' scrutineers could randomly verify via sniffer wands?

Critics say, "This will destroy grassroots racing, notably LeMons." Really? In 2006, *C/D* raced an emissions-legal Oldsmobile Aurora in a LeMons race, and in 2007, a Mazda RX-7. Both were more fun than hamsters on a hover board.

Critics further say, "This won't put a dent in cleaning the air." Are you sure?

NASCAR alone burns roughly 6000 gallons of fuel per weekend, and it sanctions more than 1500 races at 100 tracks. And consider the sports-car fields at Le Mans, Sebring, and Daytona, which log moonshot mileage.

So, am I wishing this would apply to pro racers, too? Yes, I am. How will slightly more modern stock-car engines ruin the sport? Or think about Porsche and Toyota, which recently spent an avalanche of cash to develop one-off V-4s for their 200-mph prototype hybrids. You think going one step further to make those engines clean would bankrupt them?

My plan is flawed. What to do about exhausts, for instance? Well, "cat-back" systems have been used for years, and SEMA told me, "Not all exhaust modifications are illegal, since a lot of products from our industry are CARB certified." Also, race engines are usually subjected to only one dirty cold start per day. Okay, maybe we'll lose some of the coveted open-exhaust sound. On the other hand, no one bitched about the Audi prototype diesels' soft lilt.

The one category I can't figure out is pro drag racing, where raw nitro flaming out of Top Fuel headers is critical to the show. At least those cars race only 1000 feet at a time—there's no "24 Hours of Pomona."

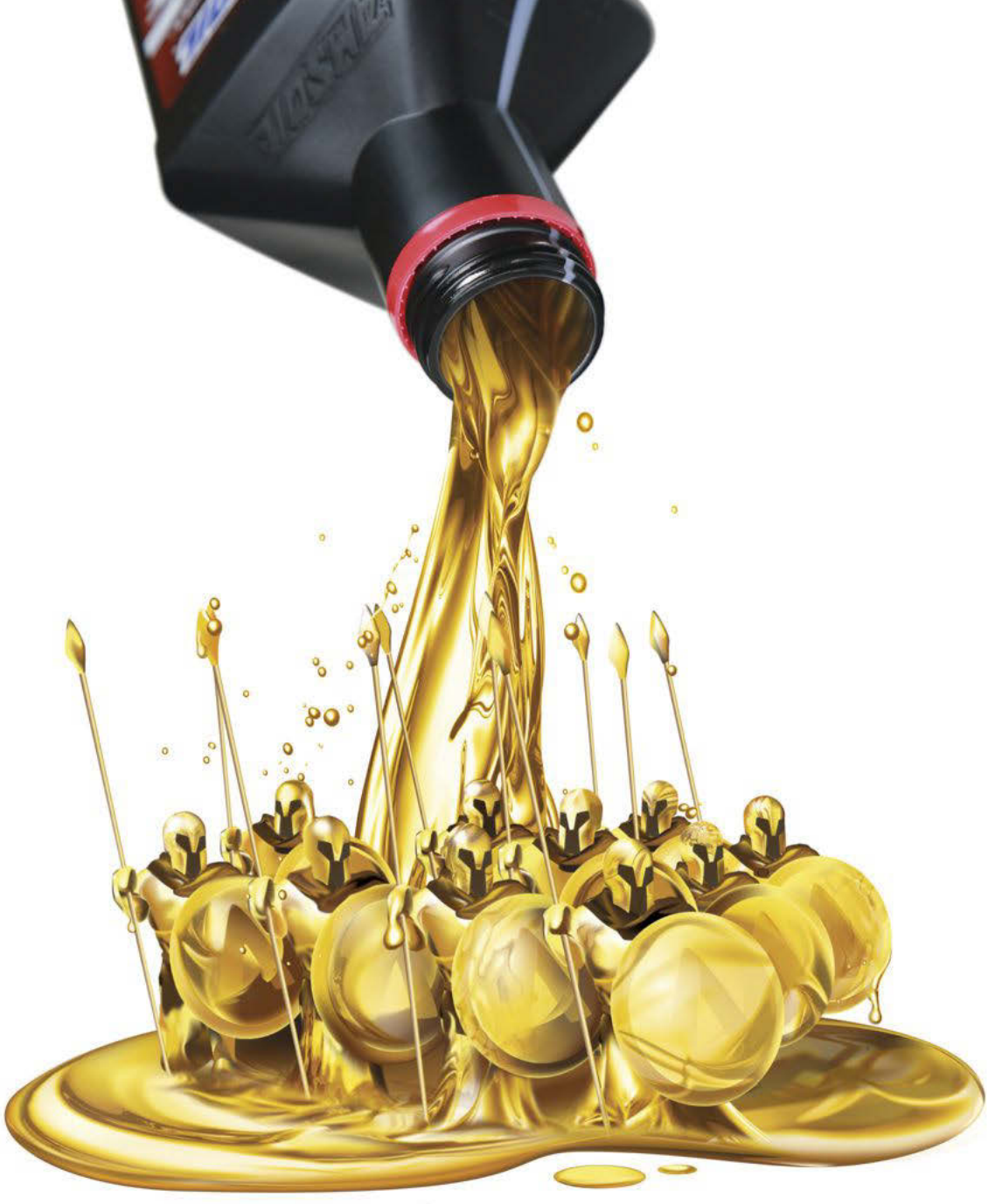
If this makes racing more expensive, well, racing has become more expensive every year of my life. And couldn't it make amateur racing *less* expensive, if hobbyists weren't weekly ponying up for the latest engine upgrades? One truism about racers is that if they don't spend money on one component, they'll spend it on another. That's why I question the aftermarketers' claims that green racing engines will diminish their $36 billion in annual retail sales. I don't see it. Racers are wily. Left to their own devices, they'll create their own go-fast parts.

Right now, maybe we're in an era where more horsepower isn't what we need. Let's make cars quicker via trick shocks, suspension pieces, reduced friction, new rubber compounds, and aero aids. And who better to sell that stuff than SEMA? Once again, SEMA emphasized to me, "We have spent millions on developing test procedures and equipment . . . to CARB-certify parts for street use." Which tells me it's already sensitive to a 100-percent emissions-legal future.

There will come a day when stamp collectors and birders say: "Hey, *my* hobby is clean. How come all these weekend warriors get to violate federal law and crud up the atmosphere?" It's a fair question. So why don't we—us—ease into this, starting in 2018? Let's do it voluntarily, before it's forced on us. Because it *will* be forced on us, especially in an era of squeaky-clean cars, when civilians begin equating our Hellcats with puppy-murdering Scud missiles. Are we too dumb to do this? Nope. Is it an inconvenience? Yep. But getting a grip on greenhouse gases will eventually inconvenience everyone. Say hello to change.

One more thing. Brock, if you're reading this, it's just a big joke. Ha-ha. I'm a joker.

John Phillips



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Back in April, the FIA Formula E circus, such as it is, trooped into Long Beach, California, and did its level best to imitate racing in the vacuum of space. Looking like three-quarter-scale Indy cars but making RC-car noises instead of

engine bawl, they cat-yowled past quietly enough to hear the skitching of tires and the poot-poot of pneumatic gearchanges. Watching, I was reminded of a scene in the 1984 film *Amadeus* in which Emperor Joseph II of Austria walks in on a rehearsal of the new opera *The Marriage of Figaro* to find dancers silently prancing on the stage, the only sound being the thump and swish of ballet slippers. "What is this," asks the confused emperor, "is it modern?" Told that his own decree against ballet in opera is the reason there's no music, Joseph watches for a second and then says: "Well *look* at them! No, no, no! This is nonsense." Mozart is told to try it with the original score, and his screwball comedy goes on to become one of the world's most beloved operas.

A lot of things seem like nonsense without music, including opera and car racing. Just two seasons old, Formula E is a ballet with a lousy soundtrack, a slightly absurd scene compelled by the many decrees of late intended to lessen the automobile's impact on the environment. Of course, it's a fanciful conceit, claiming that 50 or so minutes of electric racing somehow heals our earthly Eden, especially when the series schleps to 11 mostly urban venues on four different continents (where the juice is made in the paddock by diesel generators, albeit running biofuel). In fact, this whole column could be a counterpoint to the one written by John Phillips just a couple of pages back. But we'll set that aside for now.

Here is the basic brief: F-E vaguely resembles an F1 event with practice and qualifying sessions and a standing start. However, to finish, each driver requires not one but two of the mostly carbon-fiber race cars (so much for the low-carbon angle). About halfway through, the driver jumps from the exhausted car into a freshly charged twin during a mandatory 65-second pit stop. The teams can't just swap the 28-kWh, 770-pound batteries at the stop because, as with considerably lighter F1 engines, the battery box is integral to the car's structure and removing that pack is a serious wrench job.

This is big-government racing, meaning a thick rulebook that controls nearly everything to hold down costs. Dallara builds the chassis used by all the teams, the aero is minimal and fixed to eliminate pricey wind-tunnel development, and the electric components borrow from the McLaren P1 road car. Even the grooved Michelin Pilot Sport EV spec tire looks like ordinary road-car rubber. All the telemetry is funneled through the stewards, who distribute to the teams only a few critical data points for safety. Each time the drivers pass the pits, they must radio in their state of charge or the crews will have no idea how much longer their cars can run. Formula E would have F1's sex appeal only in a world in which everyone drove Club Car electric golf carts.

At its core, F-E is an efficiency run, rewarding the team that can pull the most speed over a given distance out of a 28-kWh pack, which is less battery than in the Nissan Leaf SV. Roger Griffiths, motorsports development director for Andretti Autosport, which fields four cars for Simona de Silvestro and Robin Frijns, told me that heat management is key. The pack must stay within a window of 70–144 degrees Fahrenheit, and as the temperature rises with each lap, the regenerative braking drops off, meaning the driver must constantly adjust his or her braking points. That, the lack of sensory input from an engine, a heavy rear weight bias, and the grooved tires make the F-E car a unique challenge to drive. Practice, qualifying, and the race happen all in one frantic day. The batteries get charged, run, cooled, and recharged three times over, says Griffith, and considering it takes 20 minutes to cool the pack and 55 minutes to charge it, every minute of the race-day clock is spoken for. The series has a five-year plan, at the end of which it's expecting to run full races without car changes under looser rules.

Meanwhile, it's hard to see what this thorny brainteaser offers for the spectators. The cars aren't particularly fast, the dicing hasn't been especially close, and the race, from green to checker, is over in less than an hour. And yet a few automakers—Renault seriously; BMW, Citroën, and Volkswagen more casually—are involved, mainly because they see F-E offering the most important thing demanded from any big-spend factory racing venture nowadays: relevance to the product.

The technology trend line, that slippery, always-shifting pole that everyone is trying to climb, currently points to electricity, which is why you don't see many V-12s in pro racing series. The E grand prix is a glimpse into our future, one in which the music will have been decreed into silence but the players will still try to put on a show. Let's hope it won't be nonsense.

Aaron Robinson

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An engine defines a car. Corvettes are synonymous with the pushrod V-8. You know a Subaru WRX is approaching before you even see it, because it sounds like a small aircraft about to make a crash landing. It's hard to imagine

a Porsche 911 without a flat-six, or a mid-engined V-8 Ferrari without a flat-plane wail. Would a Dodge Viper without a V-10 sound as sweet? Probably. The Viper sounds like someone kicked a steel trash can down a flight of stairs. But at least it sounds like something, which is more than I can say for electric motors.

Like Robinson, I am flummoxed by the electric-vehicle future. I mean, my job is to describe cars. (And to dress like the Statue of Liberty and stand at intersections to promote tax-preparation services, but that's just a seasonal gig.) And EVs all drive and sound the same. Internal combustion is a teeming ecosystem populated by strange and wonderful creatures, platypuses and aardvarks and titmice, while electric propulsion is a guy named Fred. Sometimes he takes steroids and gets all jacked up, sometimes he's out of shape, but he's always Fred. He's pleasant enough to hang out with, but after your 534th day with him, you're gonna long for the excitement of a koala-bear attack. In this example, the koala is a 1.8-liter Mazda MX-3 V-6.

I've helmed a wide array of electric vehicles, and they all hew to a certain theme. I drove a Balqon electric bus in L.A. It was slow, and when I hit the throttle it went "ScreeeHrrmmm." I drove Toyota's electric Pikes Peak racer. It was fast, and when I hit the throttle it went "ScreeeHrrmmm." The Tesla Model S P90D rearranges a driver's internal organs while going "Screee-Hrrmmm." I've even ridden a 45-mph electric recumbent tricycle called the Outrider 422 Alpha. Guess what it sounds like.

Back in the primitive world of *chooga-chooga boom-boom* engines, it would have been unthinkable that a recumbent bike would exhibit the same basic powertrain characteristics as an open-class Pikes Peak racer or a 30-passenger bus. But that's the reality of electric motors. Oh, you've got a new electric car? Let's see, does it make maximum torque at zero rpm? It does? I just guessed that, somehow. I must be clairvoyant! Let's go to the horse track. I've got a real good feeling about that mare with the equine scoliosis.

Your electric car probably also has a one-speed transmission. Save the Manuals? How about save the gearboxes? Because transmissions are another category of diversity set to be snuffed out by the EV.

I love getting into a manual Camaro and toggling the wheel paddles to activate rev-matched downshifts. I love teeing up a launch-control clutch dump in a PDK Porsche. I love climbing out of a car with a CVT and spending the next hour complaining about CVTs, right until my therapist cuts me off and asks if I'm still eating glue.

Transmissions, like internal-combustion engines, lend themselves to a wide variety of approaches that help define a car's personality. You've got your torque converters and your wet clutches and your eight-speeds and your nine-speeds and your other speeds, your manuals and autos and automated manuals. On a manual Mustang, your shift knob could be a cue ball or a skull or a piece of driftwood engraved with the Code of Hammurabi. Ever seen the shifter on a Focus Electric? I can't think of what it looks like right now, but it's probably nothing cool like a skull.

At this point you're probably thinking I'm an EV hater, one of those people who confidently declares: "You know, building a Nissan Leaf causes more pollution than burning 2 million acres of rain forest. I read that somewhere." On the contrary, I covet an electric car. A Tesla or a Chevy Bolt would answer my needs quite wonderfully. As a precursor to eventual EV ownership, I installed a 7.4-kW photovoltaic solar array on my house. By my math, my rooftop power station produces enough juice to cover about 3000 miles of electric driving per month. And I find it fascinating that we've reached this technological turning point where I can go run 11-second quarter-miles in a family car powered by sunlight. (Presuming that the family car has "P90D" in its name.)

So that's my dilemma. On the one hand, I see the glorious future, where my transportation is quick and silent and requires no tar sands, refineries, or emissions equipment. On the other hand, I daydream of wicked Hellcat burnouts and breathy McLaren boost-dumps and chirping the tires on the 1-2 shift in a manual Honda Accord coupe. All of that goes away when the world goes electric. How do you define your car's identity when you no longer have cylinder count, engine layout, fuel selection, forced induction, or transmission type? Elon Musk is evidently already thinking about this, or he wouldn't have put gullwing doors on a minivan.

I don't have the answer, but I sure hope the car companies do. By now, they know how to make electric cars. I just hope they learn how to make them interesting.

Ezra Dyer

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The Business

Once a race car, then a special edition, the Grand Sport has become the Corvette's top-selling trim. After a drive in the C7 version, we understand why.

_by Daniel Pund

_photography by Greg Pajo

2017 Chevrolet Corvette Grand Sport ▾

Exclusive First Drive

The 2017 Chevrolet Corvette Grand Sport is probably not what you think it is.

It's certainly not a ferocious factory racing machine, as the first blistered and vented Grand Sport was in 1963. And it's not the wrapper in which a new version of the Chevy small-block V-8 is presented. That was true of the 1996 Grand Sport, the vehicle first to bear the LT4 engine that stoked the embers at the end of the C4's life. One look at the new GS's muscled glutes and you'll know it's something more than just a trim and paint job, but, despite the sincere wishes of some on our staff, it is not the long-awaited mid-engined Corvette.

This GS wears the familiar red-white-and-blue get-up. But 10 body colors, six fender hash-mark hues, and five stripe options will be available.

Tadge Juechter, Corvette chief engineer and our right-seat companion for part of our first drive of the Grand Sport, puts the new car in a slightly different perspective. "This is big business for us," he says. "The last Grand Sport [of the C6 generation] kept the Bowling Green plant running. It was our highest-volume model."

Sports-car buyers are more fickle than most. Sales are hot when a new model arrives, as they certainly have been for the C7 Stingray, but then they typically go tumbling off a cliff after a few years. With its long history, the Corvette hasn't necessarily suffered as much as newcomers in this cycle of boom-and-bust because enough Americans have grown up with the unwavering desire to someday buy a Corvette—not the newest sports car, but a Corvette specifically.

Still, adding a hot, updated version a couple of years into a product's life is never a bad idea. For whatever the Grand Sport once was, it is now a full-fledged model within the Corvette lineup. And like the C6 version of the GS—as with a number of Porsche 911 variations and almost all Taco Bell menu items—the new car is an assemblage of known parts.

This particular concoction starts with the Stingray's drivetrain, the naturally aspirated LT1 6.2-liter V-8, but fitted as standard here with the dual-mode exhaust system that's optional on the base Stingray, plus the dry-sump arrangement of the Z51 version. It produces the same 460 horsepower at 6000 rpm and 465 pound-feet of torque at 4600 rpm. This level of output is what Rolls-Royce used to refer to, in typical winking understatement, as "adequate."

It is only in a world where less than $100,000 can buy you a factory-warrantied 600- or 700-hp car that 460 sounds unimpressive. Have you ever tried to fully exploit 650 horsepower on the street for anything more than a fleeting moment? If so, are you currently reading this story from the comfort of the prison rec room?

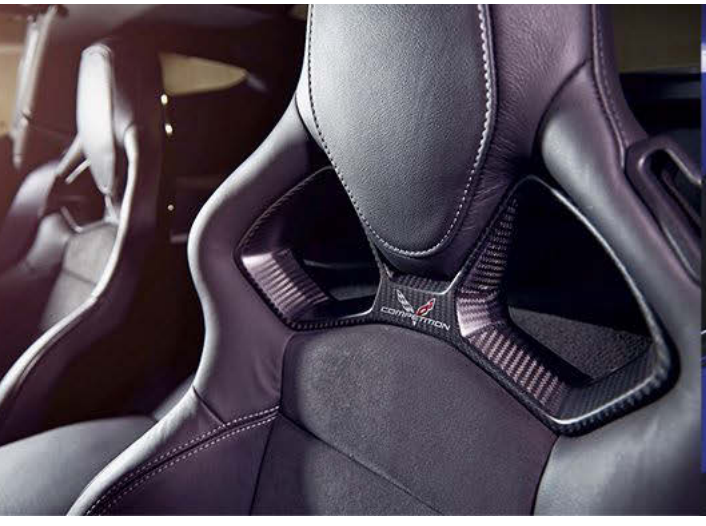
As a full member of the Corvette brood, the Grand Sport is available with either the seven-speed manual or the eight-speed automatic transaxles. In the case of the manual, it carries the Z51's shorter gearset for livelier acceleration. Opt for the automatic and Chevy specifies the Z51 automatic's 2.73:1 final-drive ratio in place of the regular Vette's 2.41:1 ratio.

The Grand Sport has the stance of a thick-bodied lizard and the feet of a gecko. Measuring 77.4 inches at its widest, the Grand Sport is only 3.5 inches wider than a standard Corvette, but it seems six inches . . . a foot . . . nay, a yard wider. The Grand Sport is, naturally, exactly as wide as the Z06, with which it shares its body panels and suspension setup. The sticky-footed car we drove wore track-ready Michelin Pilot Sport Cup 2 tires (P285/30ZR-19 up front and P335/25ZR-20 out back). They are part of the optional Z07 package that, as on the Z06, also comes with huge carbon-ceramic brake rotors (15.5 inches in diameter up front and 15.3 in the rear), plus the Stage 2 aero package that adds all varieties of aero doodads, fillips, and finger-noodlers.

As we approach the parked car, we notice the nearly featureless treads of the tires textured with hundreds of little white pebbles adhering to the flat surface. It looks as if the Grand Sport rides on enormous nonpareil candies. And truth be told, these tires and those candies are not the most dissimilar things in the world.

The suspension system is tuned to fit nicely about halfway between the Stingray and the Z06 on the passive-aggressive continuum. But each Corvette that wears the magnetorheological dampers (which come

Step away from the spec charts and bench-racing arguments. The 460-hp LT1 V-8 provides more than enough power for almost everyone.



The GS's Z07 package comes with the Stage 2 aero kit. The Stage 3, with its clear, adjustable wickerbill, was deemed too extreme for the model.

standard on the Grand Sport) has a mighty broad bandwidth of character. If you plotted the Z51, Grand Sport, and Z06 on a Venn diagram, you would find the ride and handling attributes clustered in overlapping sections. Such is the world of highly customizable, mode-shifting, electronically controlled automobilia. There's not a bull's-eye for ride and handling compromise. There are instead five dartboards, one for each of the distinct modes.

It's a far cry from 1962, when Zora Arkus-Duntov developed the original Grand Sport racer on some of the same roads through GM's Milford, Michigan, proving grounds where we're driving the new car today. In the silent home-movie-quality footage of one of Arkus-Duntov's drives, the father of the Corvette and two-time Le Mans class winner wears a sport coat, loafers, and a cue-ball-white open-face helmet while walking quickly to the car, a freshly lit cigarette dangling at a 45-degree angle to his face.

We look nowhere near as effortlessly cool, and rain hangs in the chilly spring air, but we're determined to make the best of it. (The unpleasant weather is why we chose to photograph the GS indoors). The 2017 car shares only its 6.2-liter engine displacement with the '63 Grand Sport race car. But the new production car is an extremely quick machine that's also docile and tractable in a way that would have been inconceivable in 1962. The only similarity between the two cars' behavior is that, when wet and cold, the Cup 2 tires can't cope with the Vette's power—at least, not when applied liberally—and the rear of the car fires sideways. On dry pavement, these monster tires will deliver 1.20 g's of lateral grip, says Chevy. That's a credible claim considering that we achieved 1.19 g's in a Z06 shod with the same tires. The standard Michelin Pilot Super Sports are much more roadworthy and long-lived and will deliver more than 1.00 g, which, let us remind you, is an enormous amount of grip that you are unlikely to exhaust on the road. You can get the standard tires by opting out of the Z07 package, which also drops the carbon-ceramic brakes for smaller cast-iron ones, the rotors of which are sized between those of the Stingray Z51 and the Z06. You might choose to forgo the carbon ceramics for price, but don't worry about them being loud when cold or lame when wet, like some other carmakers' carbon ceramics (we're looking at you, BMW). These are well behaved.

Either way, Grand Sport drivers should have more than enough tire, brake, and cooling capacity for serious track work. On Milford's ride-and-handling loop, a section of gentle curves and alternately ragged or lumpy pavement, the Grand Sport could only be made unpleasant by calling up the stiffest track setting and only then after encountering a series of chatter bumps. You won't do that. Left in touring or sport, the ride is admirably free of harshness and the car shrugs off nasty midcorner heaves and hillocks. As with other Corvettes, you can also personalize the settings for various systems to suit your fancy. The tuning of the dual-mode exhaust is coordinated with each mode—almost mute in eco mode and getting fairly nasty in sport and track. By modifying the threshold at which the exhaust's butterfly valves open, Chevrolet has made the Grand Sport a little more aggressive than the standard Stingray, according to Charlie Rusher, a noise and vibration engineer on the Corvette. If you're looking for someone to thank for the pitch-perfect rumble/rip of the Corvette's exhaust, Rusher would be a good candidate.

With greater aerodynamic drag than a Stingray, the Grand Sport will lose a couple of mph from the base car's 181-mph top speed, says Juechter. The Grand Sport weighs an estimated 130 pounds more than the Stingray (for a total claimed weight of 3428 pounds). Still, Chevrolet figures an automatic Grand Sport with the Z07 package will get to 60 mph about a tenth quicker than a Stingray automatic because of the increased rear traction.

Otherwise, the Grand Sport feels like what it is: a Stingray with an enormous amount of grip. And it looks like what it is: a Z06 without the completely absurd power. At $66,445, the base price of the Grand Sport coupe is about $10,000 higher than an entry-level Stingray, roughly $5000 more than the cheapest Stingray Z51, and about $15,000 less than the least expensive Z06. The convertible Grand Sport starts at $70,445. This is the sweet spot, folks.

At those prices, with that look, expect that the Grand Sport will once again be big business for Chevrolet.

2017 CHEVROLET CORVETTE GRAND SPORT

VEHICLE TYPE: front-engine, rear-wheel-drive, 2-passenger, 2-door targa or convertible
BASE PRICE: $66,445–$70,445
ENGINE TYPE: pushrod 16-valve V-8, aluminum block and heads, direct fuel injection
DISPLACEMENT: 376 cu in, 6162 cc
POWER: 460 hp @ 6000 rpm
TORQUE: 465 lb-ft @ 4600 rpm
TRANSMISSIONS: 7-speed manual, 8-speed automatic with manual shifting mode
DIMENSIONS
WHEELBASE: 106.7 in
LENGTH: 177.9 in
WIDTH: 77.4 in
HEIGHT: 48.6 in
PASSENGER VOLUME: 52 cu ft
CARGO VOLUME (CONVERTIBLE/TARGA): 10/15 cu ft
CURB WEIGHT: 3500–3600 lb
PERFORMANCE (C/D EST)
ZERO TO 60 MPH: 3.7–4.0 sec
ZERO TO 100 MPH: 8.4–8.9 sec
1/4-MILE: 11.9–12.3 sec
TOP SPEED: 175 mph
FUEL ECONOMY (C/D EST)
EPA COMBINED/CITY/HWY: 20/15–16/28 mpg

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*Available feature; Direct Adaptive Steering©. See owner's manual for details.

NISSAN SENTRA SL
Price: $25,545
Power: 130 hp
Torque: 123 lb-ft
Weight: 2951 lb
C/D observed: 31 mpg

CHEVROLET CRUZE LT
Price: $25,035
Power: 153 hp
Torque: 177 lb-ft
Weight: 2944 lb
C/D observed: 33 mpg

SOME PEOPLE WILL TELL YOU THAT EVERY MODERN VEHICLE IS A WINNER, YET SOME CARS STILL HAVEN'T MASTERED THE BASICS.

_by Eric Tingwall _photography by Marc Urbano

ELEMENTARY

There's a popular myth that, outside of sports cars and exotics, all modern cars are essentially the same. Believers claim that quality, safety, and equipment levels have reached a plateau that makes the differences between a Honda and a Hyundai somewhat moot. It's a simplified view of the world, kind of like those early grade-school report cards where you were satisfactory at best or needed improvement at worst, but either way, everyone was moving on to the next grade.

In recent years, the automotive compact class has advanced into a fleet of mini mid-sizers. Almost universally, these cars have grown in interior dimensions, inherited upscale features, and adopted prices that top out north of $30,000. But we don't buy into the notion that similarity means homogeneity. There's a distinction between satisfactory and great, just as there's a difference between the first grader who understands subatomic particles and the mouth breather who can't stop eating all the delicious, free paste. A car can go 100,000 miles without fault and spot a vehicle in its blind spot and still have deficiencies in the most elementary aspects of steering, braking, and accelerating. To sort out which small cars are at the head of the class and which need to be held back, we gathered five of the newest small entries, all sensibly equipped and priced right in the middle of the range.

Our $25,035 Chevrolet Cruze LT is the newest in this class, and this generation hadn't been tested before by this magazine. Now that GM is taking obesity seriously, the Cruze is 226 pounds lighter than its predecessor—and on par with the competition—in part due to a new engine that trades a hunk of iron for an aluminum block. The turbocharged 1.4-liter is just 2 cubic inches larger than last year's four-cylinder, but with direct injection it now

makes an additional 15 horsepower and 29 pound-feet of torque, for totals of 153 and 177, respectively.

We skipped the more expensive and torquier 1.5-liter turbo four-cylinder in the Honda Civic for the popular choice, a 158-hp naturally aspirated 2.0-liter. Our Civic EX trim is a stripper in this crowd—there's no navigation, satellite radio, or power driver's seat—but it does pack adaptive cruise control and a lane-keeping system that makes small steering inputs to keep the car centered in its lane. It's also the cheapest entrant at $22,875.

The Hyundai Elantra, redesigned for 2017, has a striking new look that suggests the carmaker hasn't backed off the throttle. Along with fresh designs inside and out and a retuned suspension, there's a new 147-hp 2.0-liter engine named Nu, from the Greek alphabet. Our $23,310 Limited comes well equipped with satellite radio and heated leather seats, with floor mats its only option.

The Mazda 3 may seem dated in this crowd of newcomers, but it has earned its place here. As our reigning champ, the 3 has already knocked off five competitors in two prior tests. Our sedan is equipped with the smaller, 155-hp 2.0-liter engine for $24,430 in Grand Touring spec. It includes leatherette seats, blind-spot monitoring, and Mazda's user-friendly infotainment system with a large control knob between the seats, as in the best luxury-car systems.

Finally, the Nissan Sentra makes its first appearance in a *Car and Driver* comparison test since 2007. After it finished in last place nine years ago, we never felt compelled to invite the Nissan back. With a recent mid-cycle refresh and the momentum of 203,509 sales last year, the Nissan finally has a shot at redemption. The $25,545 SL trim uses the same 1.8-liter four-cylinder and continuously variable transmission as the rest of the Sentra line but comes with the longest list of equipment of any car in this test.

Nissan Sentra
[+] Faster than walking, shelters you from the elements.
[–] Crude handling, uncomfortable seats, underpowered engine.
[=] The most basic transportation.

The single most thrilling thing about the Nissan Sentra is its tendency to kick its rear end out under braking. Note: We said thrilling, not fun.

To evaluate this quintet, we made the five-hour journey to Bloomington, where the roads climb and twist in ways we never expected from Indiana. We then retraced our route to our Michigan testing facility, where we exercised our contenders up and down the straight, around the skidpad, and through the slalom until we were nauseated. When we scored the cars, we made sure we weren't using a kindergarten grading curve.

5. *NISSAN SENTRA*

When deputy editor Daniel Pund described the Nissan Sentra as neither admirable nor entertainingly bad, he phrased it as if either characteristic would make this car more likable. Nissan's rolling box of bland mediocrity is only defined by compounding deficiencies. It is the heaviest and least powerful car here, the tallest and narrowest, the most expensive and least satisfying.

Aggravated by a continuously variable transmission, this 130-hp moaner only breaks through 60 mph after 9.5 seconds of thumb twiddling, more than a second behind the next-slowest competitor. Accelerating in traffic, the revs rise and fall and rise and fall again,

	2016 Chevrolet Cruze LT	2016 Honda Civic EX	2017 Hyundai Elantra Limited	2016 Mazda 3 i Grand Touring	2016 Nissan Sentra SL
PRICE AS TESTED	**$25,035**	**$22,875**	**$23,310**	**$24,430**	**$25,545**
BASE PRICE	**$20,695**	$21,875	$23,185	$23,380	$23,005
DIMENSIONS					
LENGTH	183.7 in	182.3 in	179.9 in	180.3 in	182.1 in
WIDTH	70.6 in	70.8 in	70.9 in	70.7 in	69.3 in
HEIGHT	57.4 in	55.7 in	56.5 in	57.3 in	58.9 in
WHEELBASE	106.3 in	106.3 in	106.3 in	106.3 in	106.3 in
FRONT TRACK	60.8 in	60.9 in	61.0 in	61.2 in	60.2 in
REAR TRACK	61.3 in	61.5 in	61.3 in	61.4 in	60.2 in
INTERIOR VOLUME	**F:** 52 cu ft **R:** 42 cu ft	**F:** 52 cu ft **R: 43 cu ft**	**F: 53 cu ft** **R: 43 cu ft**	**F: 53 cu ft** **R:** 42 cu ft	**F: 53 cu ft** **R: 43 cu ft**
TRUNK	14 cu ft	**15 cu ft**	14 cu ft	12 cu ft	**15 cu ft**
POWERTRAIN					
ENGINE	turbocharged DOHC 16-valve inline-4 85 cu in (1399 cc)	DOHC 16-valve inline-4 122 cu in (1996 cc)	DOHC 16-valve Atkinson-cycle inline-4 122 cu in (1999 cc)	DOHC 16-valve Atkinson-capable inline-4 122 cu in (1998 cc)	DOHC 16-valve inline-4 110 cu in (1798 cc)
POWER HP @ RPM	153 @ 5600	**158** @ 6500	147 @ 6200	155 @ 6000	130 @ 6000
TORQUE LB-FT @ RPM	**177** @ 2000	138 @ 4200	132 @ 4500	150 @ 4000	128 @ 3600
REDLINE/FUEL CUTOFF	6500/6500 rpm	6700/6700 rpm	6500/6500 rpm	6500/6400 rpm	6500/6500 rpm
LB PER HP	19.2	**17.7**	19.8	18.9	22.7
DRIVELINE					
TRANSMISSION	6-speed automatic	CVT	6-speed automatic	6-speed automatic	CVT
DRIVEN WHEELS	front	front	front	front	front
GEAR RATIO:1/ MPH PER 1000 RPM/ MAX MPH	❶ 4.58/6.0/34 ❷ 2.96/9.1/52 ❸ 1.91/14.0/80 ❹ 1.44/18.4/105 ❺ 1.00/23.0/132 ❻ 0.74/31.7/120	**Lowest:** 2.53/6.1/41 **Highest:** 0.41/37.9/125	❶ 4.40/5.5/36 ❷ 2.73/8.6/56 ❸ 1.83/12.9/84 ❹ 1.39/17.1/111 ❺ 1.00/23.3/122 ❻ 0.77/29.5/110	❶ 3.55/5.9/38 ❷ 2.02/10.3/66 ❸ 1.45/14.5/93 ❹ 1.00/20.7/132 ❺ 0.71/28.7/127 ❻ 0.60/34.0/116	**Lowest:** 4.01/5.1/33 **Highest:** 0.55/37.4/120
AXLE RATIO:1	3.53	4.68	3.07	3.59	3.52
CHASSIS					
SUSPENSION	**F:** struts, coil springs, anti-roll bar **R:** torsion beam, coil springs	**F:** struts, coil springs, anti-roll bar **R:** multilink, coil springs, anti-roll bar	**F:** struts, coil springs, anti-roll bar **R:** torsion beam, coil springs	**F:** struts, coil springs, anti-roll bar **R:** multilink, coil springs, anti-roll bar	**F:** struts, coil springs, anti-roll bar **R:** torsion beam, coil springs, anti-roll bar
BRAKES	**F:** 10.8-in vented disc **R:** 10.4-in disc	**F:** 11.1-in vented disc **R:** 10.2-in disc	**F:** 11.0-in vented disc **R:** 10.3-in disc	**F:** 11.0-in vented disc **R:** 10.4-in disc	**F:** 11.0-in vented disc **R:** 11.5-in disc
STABILITY CONTROL	partially defeatable, traction off	partially defeatable	partially defeatable, traction off	fully defeatable	fully defeatable
TIRES	Goodyear Assurance 205/55R-16 91H M+S	Firestone FT140 215/55R-16 93H M+S	Nexen N'Priz AH8 225/45R-17 91W M+S	Bridgestone Ecopia EP422 Plus P205/60R-16 91H M+S	Continental ContiProContact 205/50R-17 89V M+S

CAR AND DRIVER TEST RESULTS

ACCELERATION					
0–30 MPH	**2.6 sec**	3.3 sec	2.9 sec	2.8 sec	3.4 sec
0–60 MPH	**7.6 sec**	8.3 sec	8.3 sec	8.0 sec	9.5 sec
0–100 MPH	**21.6 sec**	22.6 sec	22.2 sec	22.3 sec	32.2 sec
0–120 MPH	**35.8 sec**	40.0 sec	—	39.4 sec	—
1/4-MILE @ MPH	**15.9 sec @ 89**	16.5 sec @ 88	16.4 sec @ 87	16.2 sec @ 88	17.4 sec @ 81
ROLLING START, 5–60 MPH	**8.0 sec**	8.4 sec	8.5 sec	8.2 sec	10.0 sec
TOP GEAR, 30–50 MPH	4.1 sec	4.0 sec	**3.9 sec**	4.0 sec	4.8 sec
TOP GEAR, 50–70 MPH	**5.2 sec**	5.4 sec	5.6 sec	**5.2 sec**	7.1 sec
TOP SPEED	**132 mph** (gov ltd)	125 mph (gov ltd)	122 mph (gov ltd)	**132 mph** (redline ltd)	120 mph (drag ltd)
CHASSIS					
BRAKING, 70–0 MPH	**168 ft**	180 ft	**168 ft**	179 ft	191 ft
ROADHOLDING, 300-FT-DIA SKIDPAD	0.82 g	**0.85 g***	0.84 g	0.82 g	0.84 g
610-FT SLALOM	39.3 mph	39.9 mph	39.7 mph	**40.4 mph**	38.5 mph
WEIGHT					
CURB	2944 lb	**2793 lb**	2914 lb	2935 lb	2951 lb
%FRONT/%REAR	60.6/39.4	60.8/39.2	61.1/38.9	60.3/39.7	59.8/40.2
CG HEIGHT	21.5 in	**20.5 in**	22.0 in	22.0 in	23.0 in
FUEL					
TANK	13.7 gal	12.4 gal	**14.0 gal**	13.2 gal	13.2 gal
RATING	87 octane	87 octane	87 octane	87 octane	87 octane
EPA COMBINED/ CITY/HWY	**35**/30/**42 mpg**	**35/31**/41 mpg	32/28/37 mpg	34/30/41 mpg	32/29/38 mpg
***C/D* 800-MILE TRIP**	**33 mpg**	**33 mpg**	32 mpg	**33 mpg**	31 mpg
SOUND LEVEL					
IDLE	36 dBA	39 dBA	**35 dBA**	39 dBA	37 dBA
FULL THROTTLE	77 dBA	80 dBA	82 dBA	78 dBA	**76 dBA**
70-MPH CRUISE	**69 dBA**	71 dBA	71 dBA	71 dBA	71 dBA

**Stability-control inhibited.*

tested by ERIC TINGWALL *and* DAVID BEARD *in Chelsea, Michigan*

The Hyundai Elantra's design is subtle, handsome, and well resolved. We hear designers say well resolved all the time. That's a good thing.

but unlike the Honda Civic's CVT, which does a passable imitation of a conventional automatic at full throttle, the Sentra's sluggish, yo-yoing behavior suggests that it's actually just hunting for the right ratio.

Hustled down a back road, the Sentra is a roller coaster erected in a dollar-store parking lot by traveling carnies. The front and rear ends of the car seem to roll out of sync, jostling and unsettling the driver around corners. Applying moderate braking with even the slightest steering input sets your heart racing as the rear of the body heaves sideways atop the suspension.

Even for unashamed buyers of basic A-to-B transportation, the Sentra is a sorry choice. The car weaves in the faintest crosswinds and wobbles side to side in the wake of semis. It tromps over expansion joints with crude chopping motions that can make the Hyundai feel like a Mercedes-Benz S-class. The driver's seat is a personal penalty box with a short seat bottom, a protruding lump in the seatback, and slick leather over hard cushioning. The highest price in the test does buy the longest list of equipment, but it's hidden in a cheap, featureless design, including a navigation system that is as small and pixelated as a 10-year-old TomTom.

Nissan knows how to build great small cars. We've seen it do so before. In the 1990s, its astonishing Sentra SE-R drew comparisons to The Sacred One, the BMW 2002. Today, the company appears to be taking full advantage of a world where everyone receives a passing grade by only making the minimum effort.

Hyundai Elantra
[+] Looks far more expensive than it is, spacious and straightforward cockpit.
[–] Noisy inside, stiff ride, uninspired steering.
[=] Still leaves a lot to be desired when it comes to the intangibles.

4. HYUNDAI ELANTRA

You can't accuse Hyundai of not trying. Just a few short years ago, the Koreans' creative work was barely distinguishable from the line art that accompanies the dictionary definition of "car." Today, with Volkswagen Group veterans Peter Schreyer and Luc Donckerwolke influencing the products and the designers, Hyundai turns out eye-catching sheetmetal. The crisp lines and perfect proportions of this $23,310 Elantra make it arguably the best-looking vehicle the company has ever offered for sale.

The artistry carries into the interior, where styling does not interfere with usable design. We love that the touchscreen is merely a secondary control to the large, logical buttons and knobs that manage the main audio and climate functions. The wide and bright cabin creates a sense of spaciousness that is a luxury in this class, even if the Elantra's interior materials feel and look a grade lower than what Chevrolet, Honda, and Mazda use.

But while the forward progress in design persists, Hyundai's incremental improvements in chassis dynamics appear to have stalled with this generation. Steering remains Hyundai's greatest challenge, with the Elantra's wheel requiring a light touch on highway slogs to compensate for the on-center dead spot. The first few ambiguous degrees of steering require either a perfectly steady hand or implementing frequent corrections to keep the car tracking straight on the interstate.

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Atkinson-cycle engines like this one use a valve-timing strategy that boosts efficiency while sacrificing torque, but the Elantra doesn't feel any weaker than the others. It clears 60 mph in 8.3 seconds, tied with the Honda, but has the added virtue of a proper six-speed automatic that shuffles gears competently and invisibly in the background. While it's comfortable for short stints, the Elantra can grow tiresome as the miles accumulate. Even if the sound meter doesn't show it, the wind and road noise penetrate deeper into your skull in the Elantra, the Nexen tires emitting a high-pitched zipping sound on concrete surfaces. Hyundai continues to show steady progress in many aspects of vehicle development, but there are several disciplines where this Elantra could still use a little more improvement.

3. CHEVROLET CRUZE

Remember the Cavalier and the Cobalt? Chevrolet wishes you didn't (except maybe the Cobalt SS). Chevy struggled for decades to grasp the compact-car curriculum before finding success with its alternative approach. True to its name, the new Cruze is a standout highway cruiser. Now lighter than its predecessor, this compact Chevy feels every bit as substantial. The suspension soaks up the road with gentle, controlled motions. The quiet cabin isolates and coddles passengers with front seats that are just deep enough to cradle without constricting. The Cruze is a mid-size car for those who can't afford or don't need the real thing.

Chevrolet Cruze
[+] Quiet cabin, pillowy ride, torque.
[–] Shows a lack of enthusiasm when the road starts to curve.
[=] The mid-size sedan for people who don't want the real thing.

That the Cruze drives like a larger car is mostly a good thing, especially for mileage warriors who spend hours on their commutes. But it also means that Chevy sacrificed the handling virtues that should be inherent in a compact car. The steering is alert on-center, but it maintains a numb lightness no matter the speed or how much lock you wind on. Fast corners are met with indifference, cushy body roll, and persistent understeer. The brake pedal also sits irritatingly high relative to the accelerator, forcing you to high-step your right leg to get your foot on top of it.

It's a bit odd that the quickest car in this test, the Chevrolet Cruze, never seems to be in a hurry to get anywhere. It generally prefers to take it easy.

The turbocharged engine delivers a glut of torque that the naturally aspirated engines can't match. There's a satisfying swell as the Cruze pulls away from a stoplight or merges onto a highway. The low-end grunt fades as revs climb, though, and the transmission compensates for a wheezy top end by upshifting 1000 rpm short of redline at full throttle. But its 7.6-second run to 60 mph still makes the Cruze the quickest in this test by a wide margin.

The six-speed automatic executes snappy gearchanges, only to be wasted on a tuning strategy designed to maximize fuel economy by short-shifting into a higher gear or hesitating to downshift when you apply throttle. The Cruze is the only car in the test with stop-start, yet that and its small-displacement engine weren't enough to win the fuel-economy category outright. The Chevrolet tied our first- and second-place finishers at 33 mpg. Small-car fuel economy with large-car manners: It's an interesting school of thought.

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2. HONDA CIVIC

Honda Civic [+] Excellent ride and handling from a solid structure. [–] A good CVT is still a CVT. [=] An all-around achiever.

We're glad to report that, after five years of hanging out with the wrong crowd at the back of the parking lot, Honda engineers haven't forgotten a thing from their high-achieving days. The reformed Civic once again rides on a gold-star chassis. It brushes off big wallops with progressive damping and dispatches high-frequency stuff as if it were nothing. Tar strips and expansion joints are heard but scarcely felt.

The excellence of both the Honda and the Mazda will convince you that lesser compact cars' handling attributes are merely side effects of their ride tuning or cost-saving measures, rather than objectives unto themselves. In the Civic, a multilink rear suspension is helped by the test's lowest center of gravity and a 121-pound weight advantage to deliver the highest cornering grip at 0.85 g, on pedestrian rubber no less.

The steering translates sharp on-center precision into immediate turn-in, but it's never twitchy on the highway. And the humble urethane steering wheel is made into a beautiful thing with Honda's meticulous graining and sculpting. A cavernous cockpit offers both the roomiest and most comfortable rear seat, yet the Civic still feels tidy thanks to clear sightlines. While our drivers all agreed that the driver's seat is perfectly shaped, Honda installed it such that the front is lower than the rear and so taller drivers complained about a lack of thigh support. Honda's seven-inch touchscreen,

the antithesis of Hyundai's easy-to-use system, relegates all the audio controls to the flat-glass pane.

The Civic's hardworking 2.0-liter reminds us that naturally aspirated engines don't need to spin to 9000 rpm to be great. It revs smoothly and produces confident midrange pull with a strong top-end finish. It's helped by a CVT that's among the best in the business. The standard drive mode reliably interprets the gas pedal's movements, and sport mode keeps the revs elevated without making things obnoxiously aggressive. As good as it is, the transmission may be the reason the Civic finished in second here. We could imagine the Honda earning the highest fun-to-drive score and reshuffling the finishing order with the standard six-speed manual. Regardless of the gearbox, this smart and fun car is once again living up to its potential.

The new Honda Civic feels alert and light on its feet while delivering a composed, comfortable ride. You can go ahead and call it a comeback.

Mazda 3
[+] Uncanny dynamics, eager engine, smooth and swift gearbox.
[–] Soft brake pedal, the tightest rear seat.
[=] Drives as if it had two fewer doors.

1. MAZDA 3

What's the advantage of being an overachiever in a world where excellence isn't always rewarded with sales? There's no compact car that corners as naturally and as fluidly as the Mazda 3; it is improbably neutral for a nose-heavy front-drive car. Where competitors reach their limits and wash out into understeer, the Mazda's front and rear ends reach peak grip simultane-

The Mazda 3 is certainly not perfect, but it remains this segment's most compelling mix of efficiency, practicality, performance, and joy.

ously. The 3's tail changes directions as willingly as its nose and that pays dividends in the slalom (and on back roads) where, despite the lowest-in-test lateral grip, the 3 snakes through bends with the highest speeds. Predictability begets confidence, which means you'll ask the Mazda to do things that you wouldn't ask of any other small car.

Because it benefits from the Mazda philosophy of chassis tuning, the 3's sharp dynamics don't require a penalty in ride quality. The suspension provides ample travel and a surprising amount of compliance on rough roads. The steering, while not as eager as the Civic's, is accurate, naturally weighted, and even sends some feedback to the driver. If the steering approaches excellence, though, the other primary controls could use some fine-tuning. The accelerator demands an unreasonable amount of effort to push through the kickdown switch to ask the gearbox for the lowest gear, and the brake pedal travels through a soft spot before the pads begin to bite.

Mazda's 2.0-liter revs heartily and sounds the best while doing so. It claimed the second-quickest 60-mph time in the test, doing the deed in eight seconds flat, 0.4 second behind the Chevrolet. The six-speed automatic is simply flawless. It is the only gearbox here that doesn't race to shift into the highest ratio around town, and downshifts are executed with smooth throttle blips.

While the interior dimensions don't show it, the 3's cabin feels like the most compact here. Both head- and legroom are in short supply for tall passengers in the rear seat. The cabin is finished with upscale materials, a fact that is largely lost in the sea of black that covers every surface.

The Mazda 3 is a specialist of sorts. The Cruze might be better suited to hour-long commutes and the Civic may be the better family sedan, but the Mazda 3 can perform either task while fulfilling a role that no other small car can. In the fun-to-drive category, where few affordable cars even try, Mazda makes the greatest effort and overwhelmingly succeeds.

FINAL RESULTS

Shell V-Power NITRO+ Premium Gasoline
The Official Fuel of CAR AND DRIVER

	Maximum points available	MAZDA 3 i GRAND TOURING	HONDA CIVIC EX	CHEVROLET CRUZE LT	HYUNDAI ELANTRA LIMITED	NISSAN SENTRA SL
RANK		**1**	**2**	**3**	**4**	**5**
VEHICLE						
DRIVER COMFORT	10	8	7	**9**	7	5
ERGONOMICS	10	8	7	**9**	8	5
REAR-SEAT COMFORT	5	2	**4**	3	3	2
REAR-SEAT SPACE*	5	**5**	**5**	4	**5**	**5**
TRUNK SPACE*	5	4	**5**	4	**5**	**5**
FEATURES/AMENITIES*	10	9	5	6	9	**10**
FIT AND FINISH	10	**8**	**8**	**8**	7	7
INTERIOR STYLING	10	**8**	**8**	**8**	**8**	5
EXTERIOR STYLING	10	**8**	**8**	7	**8**	5
REBATES/EXTRAS*	5	1	0	0	1	**2**
AS-TESTED PRICE*	20	19	**20**	18	**20**	18
SUBTOTAL	100	80	77	76	**81**	69
POWERTRAIN						
1/4-MILE ACCELERATION*	20	19	17	**20**	18	13
FLEXIBILITY*	5	**5**	**5**	4	**5**	4
FUEL ECONOMY*	10	**10**	**10**	**10**	9	8
ENGINE NVH	10	8	**9**	8	7	6
TRANSMISSION	10	**8**	7	7	**8**	2
SUBTOTAL	55	**50**	48	49	47	33
CHASSIS						
PERFORMANCE*	20	18	19	19	**20**	17
STEERING FEEL	10	**9**	**9**	7	6	5
BRAKE FEEL	10	6	**8**	7	7	6
HANDLING	10	**9**	**9**	7	7	2
RIDE	10	8	8	**9**	7	3
SUBTOTAL	60	50	**53**	49	47	33
EXPERIENCE						
FUN TO DRIVE	25	**23**	22	19	17	6
TOTAL	240	**203**	**200**	**193**	**192**	**141**

These objective scores are calculated from the vehicle's dimensions, capacities, rebates and extras, and/or test results.

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Civic Touring Coupe shown. © 2016 American Honda Motor Co., Inc.

8
THE QUADRILATERALS
"FOUR SIDED"..
HONDA

Bentley on the

Bentley Bentayga

To an off-road paradise in an on-road hedonist.

_by Jared Gall

_photography by Greg Pajo

y Rocks

A distant thrum breaks the dawn's silence, sounding for all the world like a C-130's four huge props slashing the air high above the Utah desert. We scan the sky as the noise throbs nearer. When the source finally materializes, it's actually ground-bound, a convoy of dozens of modified trucks jacked high on lift kits and oversized tires. What we thought were droning propellers is actually the burr of thousands of knobby off-road tread blocks hammering the pocked pavement. If a town can have its own theme music, this is Moab's.

Tucked among the red sandstone domes and spires of the Colorado Plateau, Moab is a mecca for all manner of outdoor activities, from rock climbing to mountain biking to BASE jumping. But during the days leading up to Easter, all other pursuits take a back seat to off-roading. The Easter Jeep Safari, celebrating its 50th anniversary this year, is nine days of four-wheeling in nature's harshest proving ground. Moab morphs into a fantasyland of lifted, caged, and rock-scarred rigs that line the streets, pack parking lots, and caravan off in every direction to attack trails with names like Where Eagles Dare and Escalator to Hell. It's a kind of Woodward Avenue without the Avenue, and cops rarely impede the dream by ticketing drivers for trivialities such as not having license plates.

Besides thousands of Jeeps overrunning this town of 5000 residents, there are passels of pickups, Toyota FJs (old and new), and purpose-built buggies wearing only a hint of production sheetmetal. Plus, this year, there was one $281,170 Bentley Bentayga.

As SUVs invade increasingly unlikely showrooms, the veneer of off-road capability grows ever more implausible. Does a Bentley trucklet really need a height-adjustable suspension or four different off-road modes? Will any owner understand the differences between "Mud and Trail" and "Dirt and Gravel," both selectable driving modes, or would the brains of Bentley drivers just lump all those words together under the umbrella of "things that are outside"?

So we challenged Bentley: If the Bentayga actually has off-road chops, prove it. Let us take one to Easter Jeep. That's how we found ourselves pitching a tent in a dusty campground alongside a Bentley. Its price was inflated nearly $50,000 from base, courtesy of extras including $5715 for paint that sagebrush and tamarisk, the local invasive plant, would imperil. Luckily we had the low-budget paint; there's also a palette of colors priced at $12,530 each.

The Bentayga's critical off-road figures are a maximum of 9.2 inches of ground clearance, 22 degrees of breakover, and 25-degree approach and departure angles. People we met on the trails repeatedly asked us, but no, it doesn't have a low range. Most agreed that, given the Bentayga's 664 pound-feet, it doesn't need to multiply its torque through additional gear reduction. And brakes that can stop a 5672-pound Bentayga from its claimed 187-mph top speed—15.7 inches up front, 15.0 in the back—dissipate heat well enough to ride them down steep descents without worrying. (This Bentayga's spongier pedal, relative to those in Bentaygas we'd driven previously, suggested that it has done plenty of high-speed work.)

Neither does the Bentayga have locking or limited-slip differentials, but the stability-control system mimics them by activating individual brakes. Heck, we didn't even have off-road tires, having made the decision to test the Bentayga fully stock. So while other four-wheelers rolled through the desert on burly Mickey Thompson Bajas and BFGoodrich Krawlers with generously reinforced sidewalls and tread blocks like clenched fists, we strutted on 21-inch Pirelli Scorpion Verdes, sized 285/45 and not at all intended for the habitat of their namesake.

A lunch of Thai chicken wraps on the Chicken Corners trail inspired us to test our "WAG bag." The western vista windshield display is optional.

The Easter Jeep Safari is hosted by the Red Rock 4-Wheelers (RR4W), a Moab-based club that rates trail difficulty upward on a scale from 1 to 10. A 7 rating, for example, means "mechanical or body damage is likely. Rollover possibilities exist," according to the EJS guidebook. Rollovers become "very common" on a 9-rated trail, at which point "winches, spare parts, and tools are recommended." The description of a 10 starts with "Let the carnage begin!"

Appropriately, we headed first for Chicken Corners, a 2. That description sounds friendlier. "County dirt road with infrequent

or light maintenance after rain or snow; high-clearance light-duty 4WD required." Here's how a county dirt road in Moab starts out: It wends through pinched canyons as a narrow shelf between a wall and an ominous drop-off, gradually degrading from dirt trail to rocky path. The walls open up to a startling and humbling vista of distant fortresses and cathedrals, their layered hues of ocher and khaki sandstone bearing romantic names like Entrada, Kayenta, Navajo, and Wingate, each one with a distinct primordial story.

Above 19 mph, the Bentayga (which is not the name of a sandstone formation but a volcanic peak on the Gran Canaria Island) automatically lowers to its "Off-Road I" ride height, and as the road climbed to the 4780-foot Hurrah Pass, the surface presented no challenge. When we rejoined the trail after a photo stop, our walkie-talkies picked up the moment a group behind us noticed the Bentley through the cloud of fine dust that trails every vehicle. "Hey," said a voice, "is that an Audi ahead of you? What's an Audi doing out here?"

"I don't think it's an Audi; it's got a B on the back."

"Must be a Baudi!"

We didn't identify ourselves as the drivers of the "Baudi" but chimed in with an anonymous, "No, it's a Bentley!" There was no response, but as we pulled off the main trail at Hurrah Pass, the radio chirped with, "Holy shit, it *is* a Bentley!"

Bentleys can—how to put this?—cultivate a certain class resentment on the street. But on the trails, people were unanimously thrilled to see it being used and tested. Our photography represents only a small fraction of the pictures shot of the Bentayga that week. Upon seeing our two-tone, purple-and-cream leather interior, one desert rat exclaimed, "That's not four-wheelin'!" Right. The seats can both cool and massage your back; it's something better.

The view from Hurrah Pass cascades to the Colorado River nearly a thousand feet below and takes in the deep-blue potash evaporation ponds miles across the valley. The trail descends west into the valley and shadows the river on a ledge about 400 feet above it for 10 miles or so before dead-ending. When we encountered a few rocks sticking up through the silt, the Bentayga's lack of limited-slip differentials didn't slow it down. The approach to obstacles is the same: Ensure tire meets rock before pricey plastic fascia does, then toe into the throttle. Any tires still on sand slip, ABS solenoids pulse, and the wheels pressed against the rock grunt and rise up and over.

The Bentayga's front-facing parking camera is an excellent stand-in for a spotter. As with many rearview cameras, lines on the screen bend with the steering angle to show the precise trajectory of the vehicle. With this system, placing a wheel exactly atop a rock or just an inch to the right is easy.

Like all elephants, the Bentayga enjoys an occasional dust bath. An off-road info screen tracks individual wheel articulation and makes the vehicle look broken.

Looking for a bigger challenge, we headed to Cameo Cliffs, a 3-rated trail. We arrived to find at least 50 trucks queued up, and they invited us to join their convoy. This trail was definitely lumpier, the view forward alternating between staring at the sky and staring into the dirt. The sand was finer and deeper here, and the rocks poking through were bigger and sharper. Clambering over them without banging underbody bits was a balancing act of approach and departure angles and ground clearance, a geometric puzzle that evolved in real time, with expensive consequences for misjudgment.

As with many other high-end SUVs, the Bentayga has a hill-descent control system—basically, an extremely strict low-speed cruise control. But in this sort of crawling, we rarely wanted to maintain the same speed all the way down a hill. The best method was to inch up onto each rock and slowly ease down off it, then roll to the next one, slowly, and repeat the elephant dance.

Hill-descent control's modulation of speed, done by loudly pulsing the brakes, jerked the car and resulted in lots of head bobbing. Riding the brakes was smoother and quieter, though the pedal's sponginess meant it was still an imperfect solution. Teetering on three wheels, we frequently released too much pressure and grabbed too much too quickly, causing unnerving fore-and-aft pogoing.

But the Bentayga crawled on, keeping its belly and bumpers out of the dirt and off the rocks, even as we tiptoed down several hills in the Cameo Cliffs that we were quite certain the Bentley couldn't climb back up. Now we were really committed.

And that was a problem. It turns out we were not on the intended route. The trailhead is a stepping-off point for numerous paths, and our group had set out to conquer Jax Trax, a 5. It was shortly after this realization that we noticed ours was the only stock vehicle in the convoy. But the guys driving the two Wranglers ahead of us helped greatly, picking their way over each obstacle,

Above left: Yes, it looks ridiculous. But the Bentayga made it through unscathed. Above: Master of all it surveys (excluding the really tough trails).

then pulling off the trail and spotting us through, directing our wheel placements with hand gestures.

Between their guidance and the perspective of the camera, we crawled up and down even the nastiest stretches without anything but rubber contacting rock. After an hour or so of nerve-racking trails, we had proven our point and it was time to preserve the Bentley. When the group stopped to take a break, we said our thanks and bowed out down a flat, sandy exit chute that led back to pavement.

It's between the painted lines where the Bentayga is most at home. With the air springs lofted up to their highest setting, the suspension runs out of travel and the ride turns awfully brittle. But in the lower modes, the Bentley rediscovers the stupendous body control that is its greatest strength. It's more agile than such a heavyweight has a right to be, though it's happiest hustling through high-speed sweepers. And the redesigned 6.0-liter W-12 needs very little notice to make any corner a high-speed one. Its 2.7-second 50-to-70-mph time matches that of the McLaren 570S we tested last month. It turns stationary into 60 mph in 3.5 seconds and slings the Bentayga to 100 mph in just 8.5 seconds.

Should an owner ever want to sling some rocks instead, the Bentayga can do that with similar ease. As we rolled back into Moab, tamarisk-inscribed pinstripes tracing through the dust caked on the Bentayga's flanks, word was spreading that a Bentley was in town and its drivers weren't afraid to use it. We were in. People peppered us with suggestions of where to take it or volunteered to meet up and roll with us on our next trail. A Jeep pulled alongside, and its excited driver invited us to join his group ride the following morning. A couple of guys flagged us down at an intersection, asking: "Is that the one? Is that *the one*?!" Yup. But it doesn't have to be the only one. We proved that the Bentayga can handle some pretty extreme off-roading. The question to be answered at the 51st annual Easter Jeep Safari is, can its owners?

2017 BENTLEY BENTAYGA

PRICE

AS TESTED **$281,170**
BASE **$231,825**

VEHICLE TYPE: front-engine, all-wheel-drive, 4-passenger, 4-door hatchback
OPTIONS: four-seat configuration, $11,015; Touring specification, $7870; rear-seat entertainment, $7315; Extreme Silver paint, $5715; Naim audio system, $4690; tailgating seat, $3200; dual front sun visors and electric rear sunshades, $2070; veneered center console, $2040; contrast stitching, $1980; 21-inch wheels, $1700; smoker's specification, $590; deep-pile floor mats, $495; heated steering wheel, $455; hand-stitched steering wheel, $210
AUDIO SYSTEM: satellite radio; CD player; DVD entertainment; 11-GB media storage; minijack, 2 USB, 2 SD card, and Bluetooth-audio inputs; 18 speakers

ENGINE

twin-turbocharged and intercooled W-12, aluminum block and heads
BORE X STROKE ..... 3.30 x 3.52 in, 84.0 x 89.5 mm
DISPLACEMENT ..... 363 cu in, 5950 cc
COMPRESSION RATIO 10.5:1
FUEL DELIVERY SYSTEM: port and direct injection
VALVE GEAR: double overhead cams, 4 valves per cylinder, variable intake- and exhaust-valve timing
REDLINE/FUEL CUTOFF ..... 6250/6400 rpm
POWER ..... **600 hp @ 6000 rpm**
TORQUE ..... **664 lb-ft @ 1350 rpm**

DRIVETRAIN

TRANSMISSION: 8-speed automatic with manual shifting mode
FINAL-DRIVE RATIO 2.85:1
ALL-WHEEL-DRIVE SYSTEM: full time with a helical limited-slip center differential

GEAR	RATIO	MPH PER 1000 RPM	MAX SPEED IN GEAR (rpm)
1	4.71	6.7	43 mph (6400)
2	3.14	10.0	64 mph (6400)
3	2.10	15.0	96 mph (6400)
4	1.67	18.8	120 mph 6400)
5	1.29	24.4	156 mph (6400)
6	1.00	31.4	187 mph (5950)
7	0.84	37.4	187 mph (5000)
8	0.67	47.3	180 mph (3800)

CHASSIS

unit construction with a rubber-isolated rear subframe
BODY MATERIAL: steel and aluminum stampings

STEERING

rack-and-pinion with variable ratio and variable electric power assist
RATIO 17.5–12.4:1
TURNS LOCK-TO-LOCK 2.3
TURNING CIRCLE CURB-TO-CURB ..... 40.6 ft

SUSPENSION

F: ind, 1 lateral link and 3 diagonal links per side, air springs, 8-position electronically adjustable dampers, electric active anti-roll bar
R: ind; 2 lateral links, 2 diagonal links, and a toe-control link per side; air springs; 8-position electronically adjustable dampers; electric active anti-roll bar

BRAKES

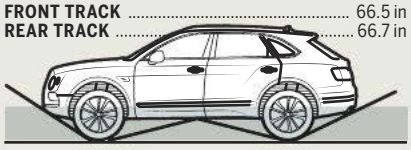
F: 15.7 x 1.5-in vented disc, 6-piston fixed caliper
R: 15.0 x 1.5-in vented disc, 1-piston sliding caliper
STABILITY CONTROL ..... fully defeatable

WHEELS AND TIRES

WHEEL SIZE ..... 10.0 x 21 in
WHEEL CONSTRUCTION ..... cast aluminum
TIRES: Pirelli Scorpion Verde All Season 285/45R-21 113W M+S

EXTERIOR DIMENSIONS

WHEELBASE ..... 117.9 in
LENGTH ..... 202.4 in
WIDTH ..... 78.7 in
HEIGHT ..... 68.6 in
FRONT TRACK ..... 66.5 in
REAR TRACK ..... 66.7 in



GROUND CLEARANCE ..... 9.2 in
APPROACH ANGLE ..... 25 deg
BREAKOVER ANGLE ..... 22 deg
DEPARTURE ANGLE ..... 25 deg
FORDING DEPTH ..... 19.7 in

INTERIOR DIMENSIONS

SAE VOLUME ..... **F:** 57 cu ft **R:** 52 cu ft
CARGO VOLUME ..... 15 cu ft

CAR AND DRIVER TEST RESULTS

ACCELERATION

ZERO TO	SECONDS
30 MPH	1.3
40 MPH	1.9
50 MPH	2.7
60 MPH	**3.5**
70 MPH	4.6
80 MPH	5.7
90 MPH	6.9
100 MPH	**8.5**
110 MPH	10.2
120 MPH	12.2
130 MPH	14.7
140 MPH	17.6
150 MPH	21.1
ROLLING START, 5–60 MPH	4.0
TOP GEAR, 30–50 MPH	2.2
TOP GEAR, 50–70 MPH	2.7
1/4-MILE	**11.9 sec @ 118 mph**
TOP SPEED (MFR'S EST)	187 mph

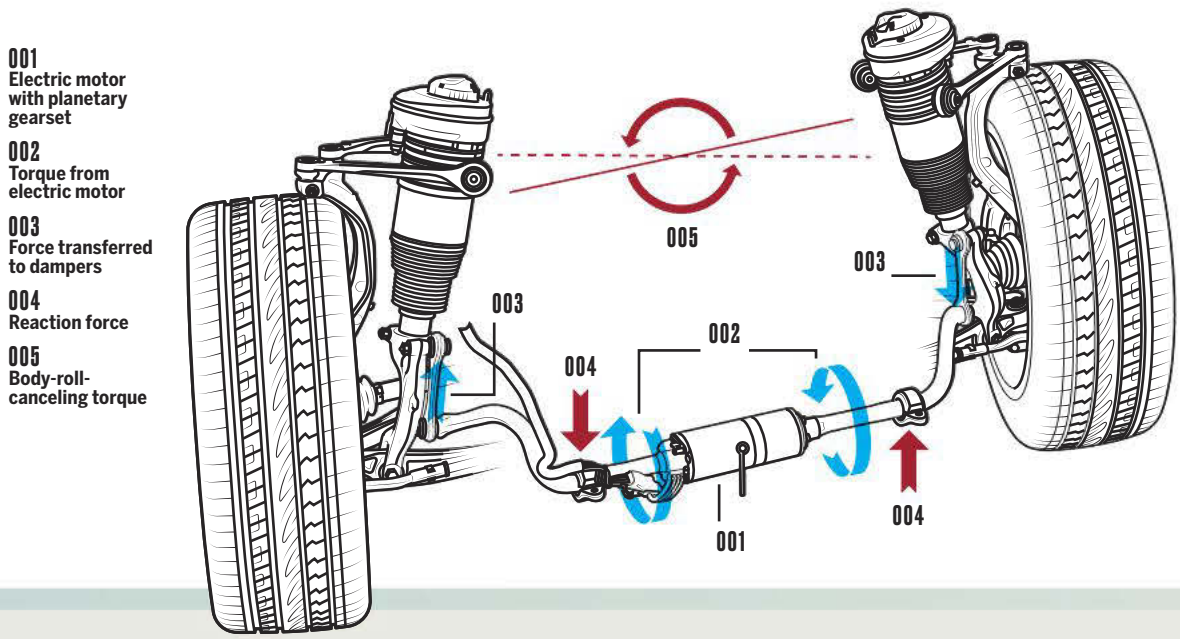
illustrations by CHRIS PHILPOT

Explained: Bentley Dynamic Ride

Wheel articulation that improves rock-crawling traction is at odds with the flat body control that aids on-road handling. To manage the competing priorities of off-road ability and handling competence, Bentley engineers split the Bentayga's anti-roll bars in two and fit electric motors between the halves. Using planetary gearsets to multiply torque, the Bentley Dynamic Ride system can input up to 959 pound-feet of torque to each anti-roll bar.

Given that the Bentayga's natural habitat is paved, the system has the most effect on handling. In corners, the motors drive the anti-roll-bar ends to press down on the outside wheels and lift the inside wheels. The resulting equal and opposite forces counteract the vehicle's body roll. The system also improves ride comfort. When the Bentayga encounters a bump while traveling straight, the motors produce an upward force that helps lift the wheels, reducing the jolt transmitted to the body. By monitoring the steering angle, the position of each wheel, and the lateral acceleration, the motors can react in as little as 0.06 second. Off-road, Dynamic Ride increases wheel articulation by decoupling the left and right wheels and using the motors to increase rather than decrease the compression or extension of the suspension.

Bentley claims it is the first automaker to use a 48-volt active anti-roll bar, but that's not saying much. In 2005, Lexus introduced a similar system that runs on 42 volts. Bentley's higher voltages allow capacitors to deliver the required power without the high current that a 12-volt architecture demands. Four times the voltage means just one-quarter the amperage can deliver the same power to the motors. That means the supercapacitors, which store this system's electrical energy, deliver a peak of 30 amps per motor rather than 120 amps. Dynamic Ride adds about 35 pounds to the Bentayga's curb weight, meaning this is a situation where engineers make a heavy vehicle handle better by making it heavier. —*Eric Tingwall*



HANDLING
ROADHOLDING, 300-FT-DIA SKIDPAD ..... **0.81 g**
UNDERSTEER ..... Moderate

BRAKING, 70-TO-ZERO MPH
SHORTEST STOP ..... **181 ft**
LONGEST STOP ..... 191 ft
FADE RATING ..... Slight

WEIGHT
CURB ..... **5672 lb**
PER HORSEPOWER ..... 9.5 lb
DISTRIBUTION ..... **F:** 56.7% **R:** 43.3%
TOWING CAPACITY ..... 7500 lb

FUEL
CAPACITY ..... 22.5 gal
OCTANE ..... 93 (recommended)
EPA COMB/CITY/HWY ..... 14/10/18 mpg (*C/D* est)

INTERIOR SOUND LEVEL
IDLE ..... 41 dBA
FULL THROTTLE ..... 74 dBA
70-MPH CRUISING ..... 62 dBA

Shell V-Power NiTRO+ Premium Gasoline
The Official Fuel of CAR AND DRIVER

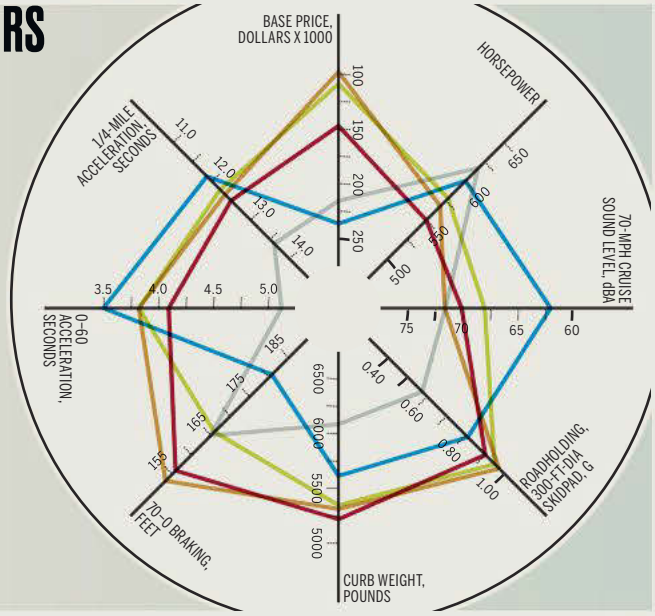
COMPETITORS

There are cheaper ways to accelerate 5000-plus pounds of metal and leather. None, however, are as quick and as quiet as a Bentley.

—

BENTLEY BENTAYGA
6.0-L W-12, 8-SP AUTO
BMW X5 M
4.4-L V-8, 8-SP AUTO
MERCEDES-AMG G65
6.0-L V-12, 7-SP AUTO
MERCEDES-AMG GLE63 S
5.5-L V-8, 7-SP AUTO
2014 PORSCHE CAYENNE TURBO S*
4.8-L V-8, 8-SP AUTO

*2016 Turbo S makes an additional 20 horses and 37 pound-feet of torque.



tested by TONY QUIROGA *in California City, California*

BMW M4 GTS

ATTRA

BMW forges its hottest track car with a little help from a cooling injection of water.

_by K.C. Colwell

C K T I V E
M POWER
M4
M WB 6562

Scientists scour the ever-expanding universe for liquid water in the hope that where there is water, there will be life. Well, turn the telescopes around, eggheads, and point them at Munich to see how BMW is injecting new life into its machines with water. Specifically, how H_2O is squirted into the intake plenum of the M4 GTS's S55 twin-turbo inline-six to make more power.

Water injection, the process of introducing water into combustion air to increase engine output, isn't a new technology. Military aircraft used it in World War II, and more than 50 years ago GM offered a water-injected turbo engine in the Oldsmobile Jetfire. It's an effective way of cooling the intake charge of a boosted engine, and since cooler air is denser air, it's richer in power-critical oxygen. In the short path from the air filter, through the turbos, up and over the dual-cam head, and through the air-to-liquid intercooler, the S55's compressed air can heat up enough to literally boil water. Indeed, that is what BMW is counting on.

The magic of water—actually any liquid—as it boils, or changes from a liquid to a gaseous state, is its cooling effect. The evaporation process converts some heat into harmless humidity. Lowering the intake temp—by about 77 degrees Fahrenheit in most driving situations in the GTS—prevents damaging engine knock, or the unwanted detonation of fuel and air. That allows BMW to both crank up the boost to 21.6 psi, versus 17.2 in the Competition-package M4, and advance the timing. The result is a 49-horse bump from the aforementioned 444-hp M4 to 493 horsepower at 6250 rpm.

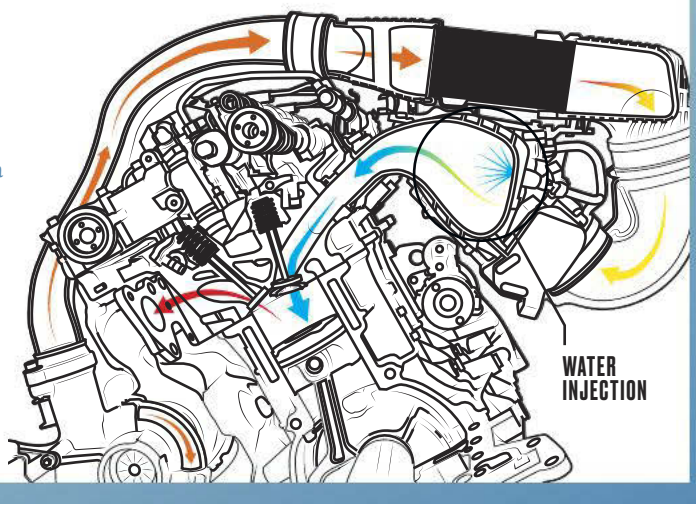
BMW could have used an E85 injection system or an alcohol-water mix with similar if not even greater performance, but according to Jürgen Poggel, M GmbH's head of engine development, those approaches would change the engine's emissions. BMW didn't want an engine that could ever be out of tailpipe compliance if the secondary tank ran dry, as a diesel does when it has consumed its urea stores.

Additional water vapor in the combustion chamber does nothing to emissions because there is nothing combustible in distilled water. Run the water tank dry and the engine reverts to the 444-hp Competition-pack tune. On a racetrack, the 1.3-gallon trunk-mounted water tank drains in step with the 15.9-gallon fuel tank.

Water injection is only active above 5000 rpm and under full load, so street drivers may only need to rehydrate every five or six tanks. (It is unclear if BMW dealerships will soon stock distilled "luxury" water at a commensurate price.) To reduce the chance of corrosion and to prevent the water from freezing, the car drains its lines every time the engine shuts down. BMW recommends draining the water tank completely if you

Explained:
M4 GTS Water Injection

The water-injection system itself is rather simple. A pump under the trunk's load floor sends water from a 1.3-gallon tank through stainless-steel lines to three injectors with corrosion-resistant steel-alloy tips borrowed from a diesel's urea injector. At full load and above 5000 rpm, water pressurized up to 145 psi mixes with the hot, boosted air. In the most extreme conditions, the system can cut the heat in the intake charge from about 250 degrees Fahrenheit down to 140. As a result, BMW cranks the boost to 21.6 psi, from 17.2. Temperature, pressure, and knock sensors determine how much water is required. *—KC*



plan to park the car for extended periods in temps below 41 degrees.

The GTS would be special even without the magic of water injection. It is the latest in a long line of hopped-up M3 specials, until now not sold in the U.S., starting with the E30 Evolution and most recently the E92 GTS packing a 4.4-liter V-8.

Perhaps you have already glanced at the specifications, eyeballed the six-figure sticker, and thought, "It had better be damn special." Well, it is. BMW swapped out a staggering number of chassis and interior components in pursuit of track performance and to make the GTS worthy of its $134,200 price.

The reservoir, pump, and valve body for the water-injection system share a compartment in the floor of the trunk with puncture goo and a tire-inflator pump.

Carbon-ceramic brake rotors join a carbon-fiber hood, roof, trunklid, driveshaft, rear wing, front splitter, rear bulkhead, rear diffuser, and strut brace in the GTS's carbon pile-on. Lightweight interior trim borrowed from the i3 is standard and there to save weight. The exhaust system is titanium downstream of the catalysts, and there are no door pockets or center-console storage bins, though the cupholders remain for your own fluid injections.

The water-injection system adds 22 pounds, and all the cars coming to the U.S. get fitted with a heavy four-point roll cage in place of the back seat. Also, U.S. cars don't get the lightweight carbon-fiber seats seen in these pictures; instead, we get lighter-than-normal sport seats with manual adjustments. The result is a U.S.-spec car that weighs 3550 pounds, or just about the same as a base M4 fitted with the dual-clutch transmission, which, sadly, is the only trans for the GTS.

BMW tapped meaty Michelin Pilot Sport Cup 2 tires, 265/35ZR-19 up front and 285/30ZR-20 in back, to wrangle the gut-punch torque and the rest of the chassis changes. The basic suspension setup remains—struts in front and a rigidly mounted rear subframe carrying a multi-link suspension—but three-way adjustable dampers with external reservoirs and adjustable spring perches (you can manually lower the car 0.8 inch for track duty) go to work here. Redesigned knuckles on the front allow for more negative camber and slightly more stability-aiding caster. The

SPLIT THE DIFFERENCE

With the front splitter manually extended 2.4 inches proud to its track position and the rear wing in the most aggressive setting of three, the extensive aero package makes 63 pounds of downforce on the front axle and 210 on the rear at 186 mph.

2016 BMW M4 GTS

VEHICLE TYPE: front-engine, rear-wheel-drive, 2-passenger, 2-door coupe
BASE PRICE: $134,200
ENGINE TYPE: twin-turbocharged and intercooled DOHC 24-valve inline-6, aluminum block and head, direct fuel injection, port water injection
DISPLACEMENT: 182 in, 2979 cc
POWER: 493 hp @ 6250 rpm
TORQUE: 443 lb-ft @ 4000 rpm
TRANSMISSION: 7-speed dual-clutch automatic with manual shifting mode

DIMENSIONS

WHEELBASE: 110.7 in
LENGTH: 185.0 in
WIDTH: 73.6 in
HEIGHT: 54.4 in
PASSENGER VOLUME: 54 cu ft
TRUNK VOLUME: 11 cu ft
CURB WEIGHT: 3550 lb

PERFORMANCE (*C/D* EST)

ZERO TO 60 MPH: 3.4 sec
ZERO TO 100 MPH: 8.0 sec
1/4-MILE: 11.5 sec
TOP SPEED: 190 mph

FUEL ECONOMY

EPA COMBINED/CITY/HWY: 19/16/23 mpg

extra grip of the Cup 2s also required a subtle change to the engine: An additional quart of sump oil is spec'd to avoid starvation in high-g maneuvers.

With the extra power and the additional stick from the Michelins, we expect the GTS to burn a launch-control quarter-mile run in 11.5 seconds. And if you get behind the wheel of a GTS, you'll do a lot of these sprints because, at full tilt, this engine sounds like a feral beast saturated with adrenaline. While BMW claims 493 horsepower and 443 pound-feet of twist, our butt dyno indicates it's more like 550 of each. Purists can rejoice that there is no artificial soundtrack pumping through the speakers here.

We only sampled the car on a racetrack, with the suspension set accordingly. Curb serrations rattle the jaw, and undulations in the pavement produce head toss dangerous to those without well-developed neck muscles. BMW could have dialed back the high-speed rebound damping a bit (there are 16 positions for it) and we still would have gotten the message.

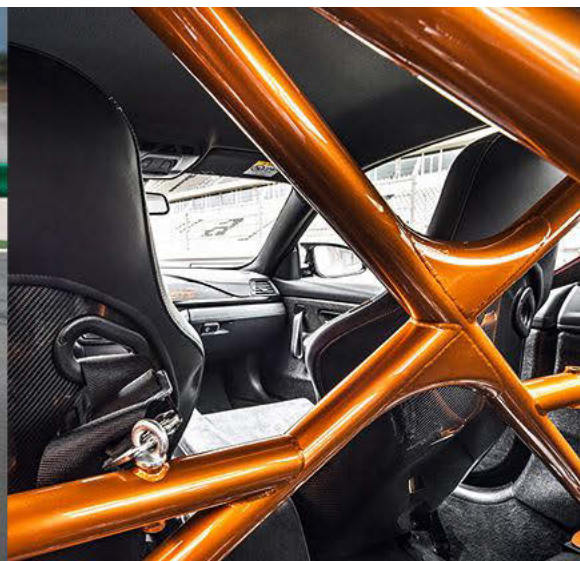
Flat-foot the gas on corner exit and the tail drifts a bit in a predictable manner, even with the stability control in its competition mode. The torque tops out at 4000 rpm, high for a modern BMW turbo, but the engine never feels peaky and it will pull hard if you roll through a second-gear corner in third.

The Cup 2s enliven the M4's steering with legitimate feedback through the suede-wrapped steering wheel, a sensation otherwise absent in this generation of M3/M4. The one thing we'd like is a larger brake pedal, or a little more spacing between the brake and throttle pedals to make left-foot braking easier.

The GTS is as legit a track car as any Porsche GT car, or so says its advertised 7:27.9 lap of the Nürburgring Nordschleife, less than three seconds off the pace of the newest 911 GT3. Obviously that gap will shrink on shorter North American tracks.

With a limited run of 700 GTSs worldwide, and only 300 heading to the U.S., this special M4 is indeed exclusive. BMW says dealers have already spoken for all of them and buyer vetting has begun. Which means you'd better have a house account at your local dealership if you want one. BMW has no worries about selling all of its U.S.-bound units and expects most to be used as dedicated track cars that don't have to be trailered to the paddock. Just don't forget to bring that distilled luxury water.

Above: For the GTS, BMW uses carbon fiber where it matters and not for interior trim. Below: The copper-orange wheels are certainly distinctive.



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Can you spot the difference?

ESP added to enable info sharing with auxiliary devices.

2011

Can you spot the difference?**

Longer range: warning distance increased on Ka-band.

2005

Can you spot the difference?

Laser warning redesigned to fit within original-height case.

2001

Can you spot the difference?

New LED display identifies each of four bands: X, K, Ka and laser.

1998

Can you spot the difference?

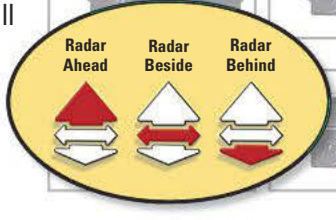
Front and rear laser-warning added; requires taller case.

1997

Can you spot the difference?

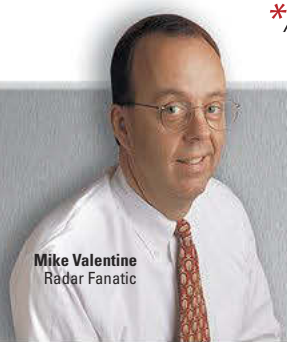
V1 debuts with radical new feature—the Radar Locator.

1992



*Answer: Nope, Junk-K Fighter is a software algorithm.

**Answer: Nope, but V1 owners sure know it's there.



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LET IT BURN

HOW QUICKLY CAN WE DRIVE THROUGH A TANK OF GAS? WE STAGE A THREE-WAY BATTLE FOR DEPLETORY SUPREMACY.

BY JEFF SABATINI

THE NEAREST PASSABLE DRINKING ESTABLISHMENT TO our HQ at Eisenhower Place is a 54-year-old bowling alley recently remodeled as an upscale lane-sports destination and rechristened Revel & Roll. We mention this not because it offers a reasonably large selection of draft beer and serves delicious deep-fried mashed-potato balls and round breadsticks we like to call cheesy fists, but rather due to its frequent appearances on *C/D* expense reports. See, the thing about holding a "feature-story development meeting" there once or twice or three times a week is that, if you keep at it long enough, eventually the law of averages kicks in and you wind up with a good idea. Or you catch enough of a buzz to convince yourself you've had one.

photograph by ROY RITCHIE

The vehicle with this test's highest average speed. (It's the silver one.) The Sequoia also returned a mileage figure nearly in the double digits.

This story had its genesis at one of those sessions, when your author, after spinning the tires of a Dodge Challenger SRT Hellcat for an entire mile down the street between our office and the bowling alley, wondered aloud how many drag-strip runs the car could make before it would run out of gas. We'd been kicking around other ideas to commemorate the recent price plummet at the pumps, a direct result of the standoff between Saudi Arabia, which is holding oil-production levels high, and Iran, which wants to compete with the Saudis in the global market. But that stuff's for the Sunday-morning talk shows. We wanted to OD on sweet, sweet crude, and this barroom bench-racing session distilled our thinking: We'd scour the *EPA Fuel Economy Guide* to find those vehicles best at burning gas, then pit them against one another to see which one could empty its tank the quickest. It would be like *The Voice* or *America's Got Talent*, but more flammable.

We briefly considered using the Challenger's powertrain twin, but the quicker Charger with its extra pair of doors seemed less appropriate for the drag strip than the car that sparked this idea. With its 13-mpg city rating, the Challenger Hellcat isn't at the bottom of the EPA's list, but it's close. There are plenty of 11- and 12-mpg vehicles, but when we scanned further through the hundreds of EPA ratings, we found that every model had at least a double-digit city rating, with one interesting exception.

Surprisingly enough, it's a Toyota. The Tundra pickup earns a 9-mpg estimate, though only when running E85. On gas, the V-8 Tundra is rated at 13. Either way, we figured that towing a trailer might enable us to see its fuel-gauge needle move in real time. After a discussion on the merits and availability of E85 and the politics of farm subsidies (over glasses of brewed-with-corn Miller Lite, appropriately), it was decided that we'd use only gasoline for our contest. But we stuck with the Toyota, eventually settling on its platform-mate, the Sequoia, which has the same powertrain but a gas tank with 11.6 gallons less capacity than the pickup's.

For the third of our proposed feats of consumption, there could be no more suitable challenge than a proper road course. And what's more suitable to bring to the track than an 11-mpg Ferrari F12berlinetta? That's a rhetorical question. Any excuse to drive through a tank of gas in a Ferrari is a good one.

With our trio of competitors picked, we booked time on the road course at Buttonwillow Raceway Park and Auto Club Famoso Raceway's drag strip, both located just north of Bakersfield, California. And to get there from Los Angeles, we'd have to cross the Tejon Pass on Interstate 5, a perfect towing challenge. Despite our tech department's pleas to complicate the rules, we kept the idea simple enough that even a bunch of drunks could understand: Fill the tanks, and the first vehicle to run out of gas while doing its thing wins. Check, please!

3. TOYOTA SEQUOIA

The three-row, eight-passenger Sequoia SUV was always the long shot. When we picked it up at the airport, its trip computer told us it was getting 14 mpg. At that rate, a full tank would be good for nearly 375 miles and take us well over five hours to drive through. Our bar-napkin calculations estimated that the track cars might empty their tanks in little more than an hour, which wasn't going to happen in the Toyota unless we dropped a match down its filler neck.

But that's why we run comparos rather than just argue about them. "Who knows," we reasoned, "the cars might break, and the Sequoia could emerge as a dark horse."

So we hitched up our rented trailer, drove the Hellcat onto it, and packed all of our luggage and testing gear inside the Toyota's cavern-

photography by GREG PAJO

ous cargo hold. That gave its 5.7-liter V-8 more than 12,700 pounds to move, and we knew we would spend much of the morning with our right foot pressed to the floor.

Headed north out of Castaic, the 28-mile run on the so-called Grapevine took us up almost 3000 feet in elevation to the top of the Tejon Pass, 4160 feet above sea level. Indeed, the throttle was often wide open, the Toyota engine roaring with the six-speed automatic in third during the steepest section, which has a 5-percent grade. Yet the Sequoia easily managed a 70-to-75-mph pace. And even though we could see the trailer bumping and swaying along in the rearview mirror, the big SUV tracked straight, as calm as Pyramid Lake, which we passed on our left.

We had reset the fuel-economy display, and by the time we reached the summit, it was showing an encouraging 4 mpg. Alas, what goes up must come down, and the 6-percent downgrade on the north side of the pass bumped mileage up into the 8s. When we turned around at the freeway exit for the almost-nonexistent hamlet of Grapevine, we had covered about 40 miles. We made two complete circuits, back and forth over the pass, and then, on our way back for another trip, the fuel warning light came on at 183 miles. We'd already been at it for more than two and a half hours. Not wanting to run the tank dry on the interstate, we turned onto California Highway 138, headed east into the high Mojave desert, and watched the distance-to-empty readout dwindle to zero.

After more than an hour of back-to-back, full-throttle runs, with its gas gauge still reading full, we thought the Hellcat might never run out of fuel.

And then we drove another 33 miles, gunning the engine and cursing the Toyota engineers for their conservative gas-gauge programming, before sputtering to a stop on a two-lane road in the Antelope Valley. While we decanted our five-gallon jerrycan, we assessed the numbers: 239 miles traveled, burning gas at a rate of 9 mpg, in three hours and 29 minutes.

	2016 DODGE CHALLENGER SRT HELLCAT	2016 FERRARI F12BERLINETTA	2016 TOYOTA SEQUOIA PLATINUM 4WD
PRICE AS TESTED	$68,780	$440,638	$66,075
BASE PRICE	$65,190	$326,745	$66,075
ENGINE	supercharged pushrod 16-valve 6.2-liter V-8, 707 hp, 650 lb-ft	DOHC 48-valve 6.3-liter V-12, 730 hp, 509 lb-ft	DOHC 32-valve 5.7-liter V-8, 381 hp, 401 lb-ft
TRANSMISSION	8-speed automatic	7-speed automatic	6-speed automatic
CURB WEIGHT	4480 pounds	3818 pounds	6088 pounds
EPA COMBINED/ CITY/HWY	16/13/22 mpg	13/11/16 mpg	14/13/17 mpg
C/D OBSERVED	4 MPG	4 MPG	9 MPG
DISTANCE COVERED	89 mi	89 mi	239 mi
FUEL CONSUMED	19.9 gal	23.7 gal	27.6 gal
TIME TO EMPTY	127 min	80 min	209 min
AVERAGE SPEED	42 mph	67 mph	69 mph
MAXIMUM SPEED	128 mph	130 mph	77 mph
PEAK ACCELERATION	0.95 g	0.77 g	0.56 g

2. DODGE CHALLENGER SRT HELLCAT

Fun fact: You can do 83 consecutive quarter-miles before the 707-hp Challenger Hellcat runs out of gas. This feat took us exactly two hours and seven min-

For fans of unnecessary precision, the Challenger Hellcat actually achieved 4.47 mpg, while the F12 got 3.76 mpg. So, congratulations, Ferrari. We round our numbers in deference to our sane readers.

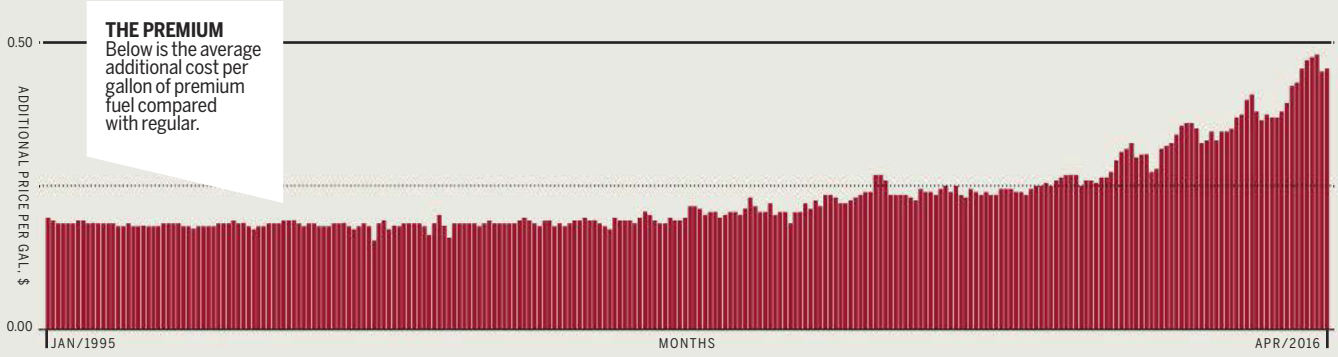
Why Is High-Test So Expensive?

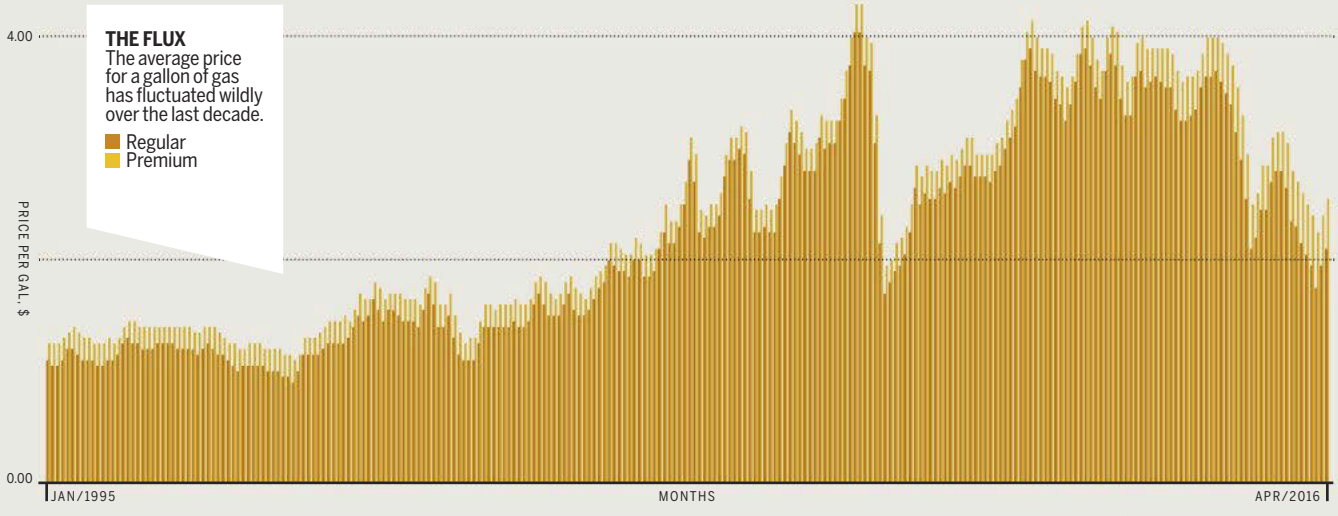
From 1995 through 2005, the national average price difference between regular and premium unleaded was 18 to 19 cents per gallon. Even when gas dropped below a dollar in 1999 or broke the three-dollar mark in 2005, the premium for premium remained consistent. It ticked up some over the next few years, with the delta growing to 25 cents by 2011. But since then, the price of high-test has been on a tear. The average upcharge reached 40 cents in 2015; this year it's already grown to 47 cents.

The cause of this widening gap is a combination of factors, according to Patrick DeHaan, an analyst with GasBuddy.com. An increasing number of cars require premium, the share growing from 20 percent in 1996 to 50 percent today. But the refining industry is still mostly geared toward producing regular-grade gas, particularly in the Midwest, leading to a shortage of both high-octane blendstock and alkylate, an octane booster. New marketing efforts by oil companies have also raised prices.

If there is a silver lining here, it is that even with premium priced 40 to 50 cents more than regular, some unwary gas stations have been selling higher-octane gas below cost. Earlier this year, DeHaan says, stations in the Chicago area were paying as much as a dollar per gallon extra for premium without raising prices. "Not many small stations look at the premium number," he says. "They don't sell a lot of it."

Every silver lining's got a touch of gray, however, and DeHaan predicts that retailers are going to continue to raise prices for premium until demand drops or production capacity catches up. "It may get worse before it gets better," he says. —*JS*





Data from U.S. Energy Information Administration

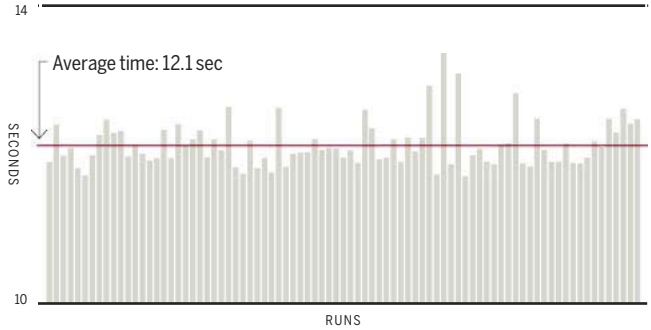
utes, which is a pass every minute and a half. Assistant technical editor David Beard took every run, dipping into the 11s 35 times while averaging 12.1 seconds at 126 mph. He is now the fastest member of our staff by volume. Throughout this ordeal, the Challenger behaved as if it were heading down I-5 toward L.A. with the cruise control set at 65 mph, which it did immediately afterward. You could set an atomic clock with this car.

Not that there wasn't a little drama. When we arrived in the morning, the track manager and the two guys running the tree had been joined by one of the owners of the facility and two of his drag-racer buddies. It seemed as if they were keen to see some carnage. Their conversation fell into a rhythm set by the chirp of tires, the whine of the 6.2-liter V-8's supercharger, and the exhaust blasting into the distance. But after about 40 runs, when the only thing notable was the Hellcat's oil temperature rising to 255 degrees, they got bored and went to lunch. Then the track manager went upstairs to the office to do some work. We ate jerky, collected timing slips, and waited for the gas gauge, which was still reading full, to move.

After the 48th pass, an hour and 15 minutes in, the needle finally came unstuck. Two passes later it had dropped to two-thirds, and our photographer, eyeing the weather forecast for afternoon rain, started

Let's Go to the Slips

The Hellcat posted solid, consistent times, even as the engine sputtered. Beard was eating a lobster during that really slow run.



calculating how long 150 passes might take. When we reached 63 runs and still had a half-tank indicated with dark clouds on the horizon, we all got worried. A few scattered raindrops fell, but by run 74 the gas gauge had dropped to a quarter and the range predictor read "low."

Two hours after it began, we heard the engine sputter on run 79. It was as exciting as seeing a sunrise at Le Mans. On the last four runs, the Challenger continued to struggle, with the engine cutting out around 100 mph. It still ran in the low 12s. Then it shut off on the return road, its gas tank dry, our day at the strip ending just before things got really wet.

1. FERRARI F12BERLINETTA

Modern cars do not want you to run them out of gas. The Toyota will trick you into stopping by lying about its range, the Dodge will back you off its throttle, but the Ferrari shuts you down, shaming the driver's stupidity by going into a limp-home mode that restricts speed to 31 mph. In our case, this was preceded by a "Catalytic Converter Temperature Not Plausible" message on the instrument panel, a warning that could only be improved if it were a simple Italian "*Siamo fottuti*."

Like the Sequoia and the Challenger, the F12 was nothing if not consistent. With our driver lapping at about eight-tenths to save the Michelins, his most difficult task was trying not to fixate on the F12's fuel gauge. It proved to be more linear than the Hellcat's but seemed to slow its descent as it approached empty.

That the car forced us to conclude our lapping session by circling the parking lot, its sonorous 6.3-liter V-12 using just a fraction of its 730 horsepower, did not keep the F12 from winning the challenge. Its gas tank ran dry after an hour and 20 minutes, in which senior editor Tony Quiroga completed 28 laps of Buttonwillow's three-mile, 22-turn circuit. Not only did the Ferrari win on time, but it also tied the Hellcat for the shortest distance, 89 miles, and gulped gas at an observed fuel economy of just 4 mpg.

You know what's more "not plausible" than the Ferrari F12's catalytic-converter temp? That Ferrari loaned us an F12 to lap until we ran out of gas.

"It was both thrilling and boring at the same time," opined Quiroga.

That's an appropriate coda for our endeavor, which in retrospect resembled other somewhat pointless things we enjoy doing. Fishing, for example, and liking stuff on Facebook, and listening to "Drums and Space." We could lie to you and say that this waste of fuel had something to do with proving out the advances of modern technology. Because had we attempted this stunt two decades ago, something certainly would have broken. But truly, the lesson here is that even at the $4.79 per gallon we paid to refuel the Ferrari at the track, gas is cheaper than beer. And, using the right car, even more fun to consume.

Dan Alvarado, 9 year WeatherTech® employee, started at the warehouse packing products into boxes. He transferred to work in the toolroom as an apprentice 8 years ago and is now a Senior Level Machinist.

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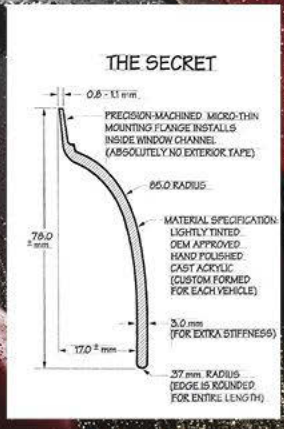
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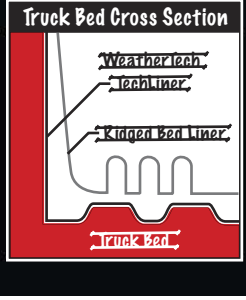

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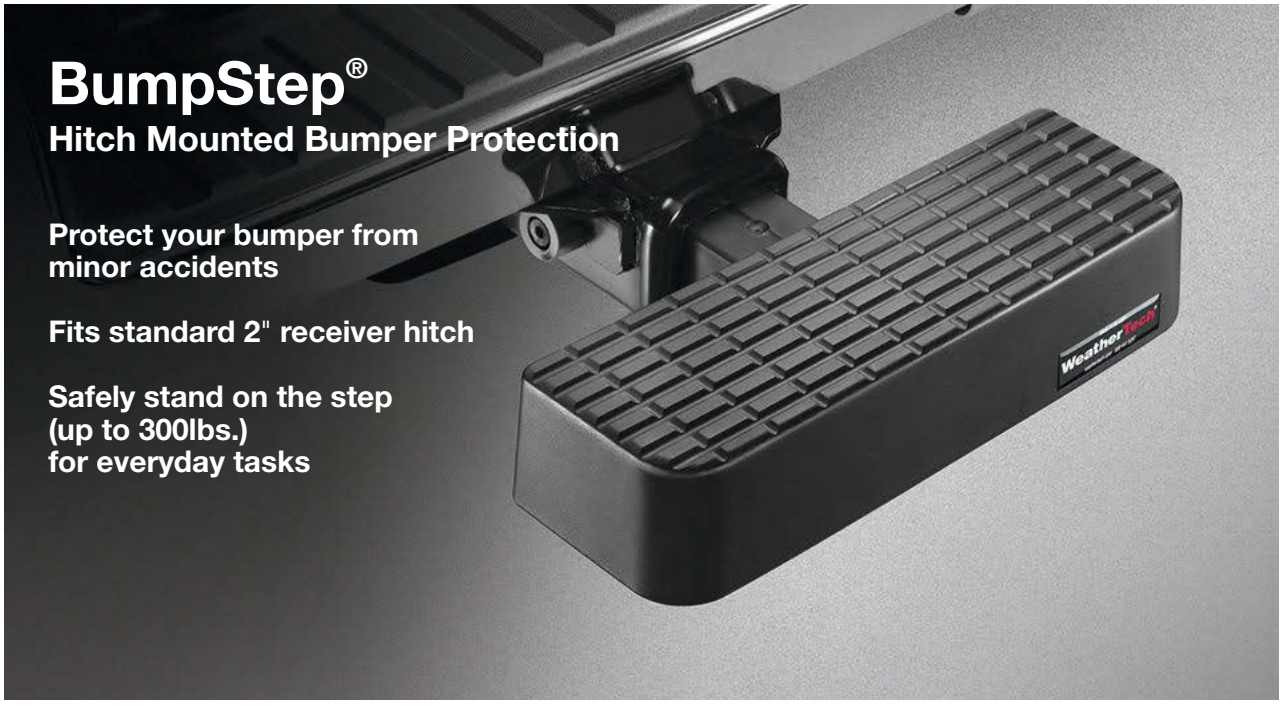
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Improved. But Better?

Porsche's new **718 Boxster** gains power and efficiency, losing some magic in the process.
_by Josh Jacquot

IT'S SUBTLE, BUT IT'S THERE. Listen carefully when chugging along at low speeds in Porsche's new flat-four–powered 718 Boxster and you'll recognize what you hear. Sure, it's damped by water jackets and a turbo, distinctly lacking mechanical clatter and subdued by decades of internal-combustion progress, but there's no denying its fundamental thrum. Under all the modern gloss is the undeniable lope of an air-cooled Volkswagen Beetle. This is probably not what Porsche wants you to notice first about the new Boxster, and it likely won't be because you'll be too busy caning the thing to be concerned with such nuance, but it's there, the ghost of the old pancake.

As before, the 718 Boxster initially comes in only two versions: the 300-hp base and 350-hp S model. Either can be had with a six-speed manual or a seven-speed dual-clutch (PDK) transmission. Fifty horsepower is no pittance, but the difference between the base and S-model 718 Boxsters is nothing relative to the vast chasm that separates them, experientially, from their predecessors.

The 718's turbocharged flat-four powerplants, displacing 2.0 and 2.5 liters, respectively, are the headlining changes. Both yield 35 more horsepower than the naturally aspirated 2.7- and 3.4-liter flat-sixes they replace. Torque increases by 74 pound-feet in the base car and 43 in the S. However, Porsche claims the driving force behind the switch to four cylinders is improved fuel consumption. But that remains an elusive target. In at least one case, it's lower: EPA combined fuel economy on manual-trans cars drops from 23 to 22 mpg on S models and holds station at 24 mpg on base cars.

The turbo engines' power delivery dominates the 718 story. The S model torques its way out of corners with a guttural yank that seems somewhat out of character with the Boxster's reason for existing. If this is a sports car meant for driving hard, then it will be driven at high rpm. It's not as if this engine won't rev—the redline is 7400 rpm—it's that the need to do so and the payoff are now greatly diminished. The torque peaks at a much lower 1950 rpm in the base model and 1900 rpm in the S model. In the six-cylinder models, the party started at 4400 to 4500 rpm.

[+] Quick and sharp, sincere chassis.
[–] Flat-six wail replaced by flat-four thrum.

That both remain fast and rewarding cars is not in question. Rather, it's whether these improvements translate into better sports-car-driving experiences.

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Going back to the first-generation Boxster, the car's most defining trait was a world-class intake yowl climaxing in an incendiary crescendo just before redline. If that single authentic virtue were the only redeeming experience in the old Boxsters (it wasn't), they would still have been fantastic. Now it's gone, replaced by an aggregate of sounds, some genuine, some buried, some contrived.

Around town there are faint turbo hisses that Porsche's sound committee allowed to linger. Spin a gear to redline, however, and these are supplemented by a synthetic blat, which builds with revs. Using the engine's manifold-pressure sensor, engineers tap the flat-four's natural resonances and amplify them in the cockpit via a speaker built into the firewall. And it works. There's noise. Some of it is good, but none of it will define this car.

Pushed hard in sport mode, the flat-four burbles and pops on overrun. Opening the wastegate momentarily during engine braking creates the concert. Flip to sport plus and these sounds vanish as the engine prioritizes response over aural drama. Boost relies on a closed wastegate, so sport-plus mode sacrifices the charade to deliver better performance.

The gear ratios in the PDK don't change from before; they're tall and widely spaced from one another, which has long been typical of Porsche. The final drive is even slightly taller than it was previously, while the base and S now share manual-transmission ratios, which are just the taller set from the outgoing Boxster S. As such, PDK-equipped cars are good for about 74 mph in second gear while manual-transmission cars wind all the way to 81 mph before needing third. The result is less shifting, which Porsche representatives are quick to point out is faster. We wouldn't argue if shifting weren't part of the driving experience to be relished. But in a world where the experience matters more than lap times, it is. Or should be. A shorter final drive and closer spacing between the lower gears would make it more fun.

Shifting only once on the way to 60 mph lowers time to that milestone, certainly. Porsche claims that the Boxster S in sport-plus mode will get there in 4.0 seconds, but its performance claims often understate what we find in testing. We project a 3.9-second run, or 0.5 second quicker than we saw at the track with the previous-generation manual-gearbox S. The base 718 also sees an improvement, with Porsche claiming a 0.7-second reduction in zero-to-60 time (to 4.5 seconds) for the PDK model with the Sport Chrono package.

These 718 Boxsters are obviously quicker and in many ways easier to drive than cars with engines that require more revs. But for us, the formerly gratifying sensory experience of working the cars is diminished.

Steering this Boxster is pure joy, however. No company cares more about what happens when a car's steering wheel is turned than Porsche. And that ideal is on grand display here in the model that leverages physics better than any other Porsche. If electric assist was once something to be doubted, those days end now with a car that offers steering weight, response, and feel as good as or better than anything else sold today.

These are machines committed to both intimate communication and immediate reaction. Single-lane roads become playgrounds with a variety of line choices. Potholes become slalom cones. Even mid-corner bumps are frequently trivial.

Porsche Active Suspension Management (PASM) offers a distinguishable difference

Below: The 718 borrows its steering-wheel-mounted mode selector from the new 911. Bottom: Turbocharged or not, the 718 looks as lovely as Boxsters always have.

2017 PORSCHE 718 BOXSTER/S

VEHICLE TYPE: mid-engine, rear-wheel-drive, 2-passenger, 2-door convertible
BASE PRICE: $57,050–$69,450
ENGINES: turbocharged and intercooled DOHC 16-valve 2.0-liter flat-4, 300 hp, 280 lb-ft; turbocharged and intercooled DOHC 16-valve 2.5-liter flat-4, 350 hp, 309 lb-ft
TRANSMISSIONS: 6-speed manual, 7-speed dual-clutch automatic with manual shifting mode

DIMENSIONS
WHEELBASE: 97.4 in
LENGTH: 172.4 in
WIDTH: 70.9 in
HEIGHT: 50.4 in
TRUNK VOLUME (FRONT/REAR): 5/4 cu ft
CURB WEIGHT: 2950–3100 lb

PERFORMANCE (*C/D* EST)
ZERO TO 60 MPH: 3.9–4.8 sec
ZERO TO 100 MPH: 9.4–11.2 sec
1/4-MILE: 12.4–13.4 sec
TOP SPEED: 170–177 mph

FUEL ECONOMY
EPA COMBINED/CITY/HWY: 22–24/20–21/26–28 mpg

Drivelines

between modes and allows decoupling of its stiffest setting from the sport-plus drive mode. This is a low car with relatively little suspension travel, and yet it acquits itself far better than it should on uneven terrain. Three ride heights are available—a standard passive damper setup and two PASM versions with a 0.4- or 0.8-inch-lower ride height.

Little has changed dimensionally from the outgoing car. The wheelbase and width are identical; its length is virtually the same. Despite using a carryover softtop, the Boxster still provides an efficient and practical lid. It deploys in nine seconds at speeds up to 43 mph.

The Boxster has made our annual 10Best list almost continuously since 1998. The new 718 will likely remain our favorite convertible between $50,000 and $100,000 when it goes on sale this summer. Pricing starts at $57,050 for the base model and $69,450 for the S.

When it comes to outright speed and driving reward, only the Chevy Corvette convertible is close. And that's an alternative we'd bet few Boxster owners consider. Certainly there are others, the BMW Z4, the Mercedes-Benz SLC, and the Jaguar F-type convertible among them. But even Porsche engineers don't hesitate to laugh at most of these as true benchmarks for their mid-engined sports car. In that regard, the Boxster stands out as a car for those who appreciate not only a real driver's instrument but also a genuinely well-made machine.

Both Boxsters are capable and rewarding cars worthy of the name they bear. Had their flat-six–powered predecessors never existed, we'd be singing their praises without hesitation. But these are driver's cars, not race cars. They exist to produce pleasure, not lap times. And using that as the yardstick, Beetle sounds aside, it's hard to say that this Boxster is better in every way than the car it replaces.

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TESTED

It's Still Breathing

Porsche's **Boxster Spyder** is the last of the naturally aspirated Boxsters. It will be missed. _by Tony Quiroga

A THOROUGH REDO of the Boxster is here, though after spending a week with the outgoing Spyder, we have to conclude that nothing needed fixing. A close kin to the Cayman GT4, the Spyder is a limited-production model that borrows the 911's engine.

The hand-me-down six comes from the older 911 Carrera S, not to be confused with the new turbocharged 3.0-liter flat-six that powers the refreshed 911. We love the old naturally aspirated 3.8-liter, even here, in its detuned, 375-hp state. It has just the right amount of snarl from the intake and a deep metallic rasp from the standard sport exhaust. This engine gives new meaning to talking behind your back.

It might lack the low-end torque of the boosted 911 engines, but revving the Spyder to its 7600-rpm redline and shifting the six-speed manual is mechanical bliss. Running it hard never feels like abuse. On the contrary, it seems better and happier the harder you push. Its joy becomes your joy.

[+] A hard-core Boxster with a soul-filled loud pedal.
[–] Good never comes cheap.

As previously noted, Porsche's electrically assisted steering is the best we've laid hands on. The Alcantara-wrapped steering wheel provides real feedback. It's so good it almost feels unassisted. Grip is phenomenal at 1.01 g's, and the chassis is planted and secure all the way to that point. Likely due to its narrower rear tires, the Spyder is more neutral than the GT4, which only makes it more engaging. We prefer the Boxster Spyder's chassis setup to the GT4's, even if the latter has more ultimate grip.

From a dynamics standpoint, the Spyder nears perfection. The top takes more steps and time than the standard Boxster's, true. But when a car gets you this high, you won't know or care if the top is up or down. You'll just want another hit of 7600 rpm.

2016 PORSCHE BOXSTER SPYDER

VEHICLE TYPE: mid-engine, rear-wheel-drive, 2-passenger, 2-door convertible
PRICE AS TESTED: $89,375
BASE PRICE: $83,150
ENGINE TYPE: DOHC 24-valve flat-6, aluminum block and heads, direct fuel injection
DISPLACEMENT: 232 cu in, 3800 cc
POWER: 375 hp @ 6700 rpm
TORQUE: 309 lb-ft @ 4750 rpm
TRANSMISSION: 6-speed manual

DIMENSIONS

WHEELBASE: 97.4 in
LENGTH: 173.8 in
WIDTH: 70.9 in
HEIGHT: 49.7 in
TRUNK VOLUME (FRONT/REAR): 5/5 cu ft
CURB WEIGHT: 3040 lb

C/D TEST RESULTS

ZERO TO 60 MPH: 4.0 sec
ZERO TO 100 MPH: 9.1 sec
ZERO TO 150 MPH: 22.5 sec
ROLLING START, 5–60 MPH: 4.7 sec
1/4-MILE: 12.2 sec @ 116 mph
TOP SPEED (MFR'S EST): 180 mph
BRAKING, 70–0 MPH: 152 ft
ROADHOLDING, 300-FT-DIA SKIDPAD: 1.01 g

FUEL ECONOMY

EPA COMBINED/CITY/HWY: 20/18/24 mpg
***C/D* OBSERVED:** 17 mpg

Balancing Act

WHAT A RACK!

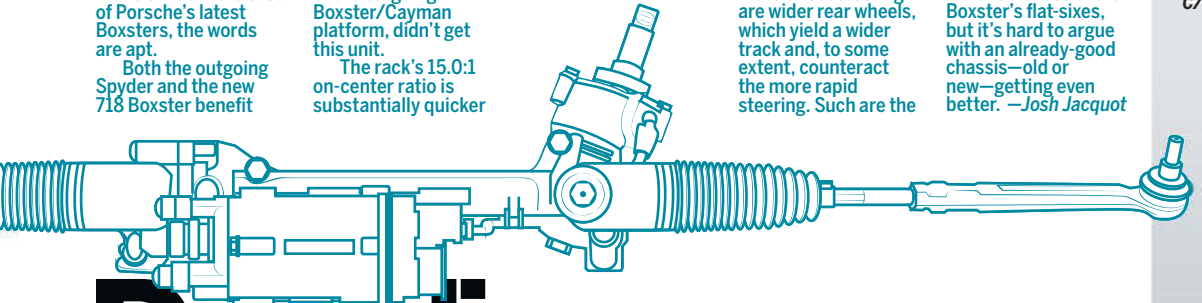
"Improved agility" is a meaningless platitude tossed around by auto execs at introductions of glittering new models. But in the case of Porsche's latest Boxsters, the words are apt.

Both the outgoing Spyder and the new 718 Boxster benefit from a quicker steering rack that does indeed improve agility. That the rack is shared with the longer, heavier 911 Turbo might just make it the best parts-bin tweak in history. Ironically, even the uncompromised Cayman GT4, the performance pinnacle of the outgoing Boxster/Cayman platform, didn't get this unit.

The rack's 15.0:1 on-center ratio is substantially quicker than the 16.6:1 used in outgoing Boxsters. Both use a variable ratio that decreases numerically as it's turned farther from center. In other words, the more the wheel is turned, the more steering lock it yields. The result is less response in the straight-ahead position and more response when cornering. Quicker steering is a subtlety not lost on competent drivers, and its effect is noticeable, even without back-to-back drives in Boxsters with different racks.

Balancing the more direct steering are wider rear wheels, which yield a wider track and, to some extent, counteract the more rapid steering. Such are the nuances of chassis tuning. New Boxsters gain 0.5 inch in rear-wheel width on both base and S models, up to 9.5 and 10 inches versus their outgoing counterparts. The Spyder's rear wheels are wider still at 10.5 inches.

We might, for now, lament the loss of the Boxster's flat-sixes, but it's hard to argue with an already-good chassis—old or new—getting even better. —*Josh Jacquot*



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TESTED

A Case for the V-6

Chevy's 2.0-liter turbocharged four-cylinder **Camaro** lives in the shadow of a powerful, efficient, and cost-effective V-6. _by Tony Quiroga

THE CHEVY CAMARO offers three engine choices. Two of them lie on the spectacular side of the spectrum, but the third, the new 2.0-liter turbo four, isn't quite up to the excellence of the rest of the car. It's the engine with the faint turbo whistle, the one that moans like no Camaro should.

A Camaro with an inline-four sounds about as appealing as a tofu salad at a Chicago steakhouse. Judged only by the numbers, though, it's still respectable. The 2.0-liter four, maxing out at 20 psi of boost pressure, is good for 275 horsepower and 295 pound-feet of torque. It might have the lowest output available in a Camaro, but the 2.0 is also the lightest version of the car at 3410 pounds, or 59 pounds less than the V-6 and more than 300 pounds lighter than the V-8.

With the least amount of mass to wrangle, the four and a quick-shifting six-speed manual pounce to 60 mph in 5.4 seconds. The quarter passes in 14.1 seconds at 97 mph. With the 335-hp V-6, we measured zero-to-60 and quarter-mile times that were 0.3 and 0.4 second quicker, respectively. But the numbers are only part of this story.

[+] Solidity, refinement, handling excellence. [–] Dull engine, can't see daylight.

Fact is, the four-cylinder Camaro isn't an endearing proposition. Despite the sound pumped into the cabin, the four's gravelly voice is nowhere near as sweet as the optional V-6's or V-8's. The engine is unresponsive, too. It resists revs and feels as if it's working against a massive flywheel. For the best acceleration, we launched at 4000 rpm and shifted between 6000 and 6500, well short of the 7000-rpm redline. Shifting any closer to the rev limit only wasted time. From its meek tone to its reluctance to play, the four doesn't have a sporting bone in its block, no matter what the numbers read.

Some might argue that the four isn't supposed to be the sporty choice; it's the least expensive Camaro, and the efficient one. If only it were more efficient. In our hands, the 2.0-liter sucked down a gallon of premium every 19 miles, short of the EPA's 24-mpg-combined estimate. We achieved an identical 19 mpg with the V-6, but at least the six happily burns regular.

The engine's shortcomings are especially apparent since the rest of the Camaro is so good. A small, flat-bottomed steering wheel sends clear signals from the road. A stiff ride can be traced to aggressive spring rates and optional 20-inch wheels with run-flat tires, but the structure never quivers or protests. Despite the all-season rubber, the Camaro circled the skidpad at 0.89 g and stopped from 70 mph in 170 feet. Eager and playful, the Camaro practically begs you to spend $1495 for the V-6.

Seeing out of the Camaro remains difficult, and the design is a love-it-or-leave-it affair. Camaros aren't for everyone, but a Camaro with a 2.0-liter turbo is, shall we say, for no one.

Tale of the Tape

LESSER CAMAROS COMPARED

■ CAMARO V-6 MANUAL ■ CAMARO 2.0T MANUAL

ZERO TO 60 MPH:
5.1 sec
5.4 sec
6

ROLLING START, 5–60 MPH:
6.0 sec
6.4 sec
7

ZERO TO 100 MPH:
13.0 sec
15.0 sec
15

1/4-MILE:
13.7 sec @ 103 mph
14.1 sec @ 97 mph
15

ZERO TO 130 MPH:
24.5 sec
30.3 sec
35

EPA COMBINED FUEL ECONOMY:
21 mpg
24 mpg
25

2016 CHEVROLET CAMARO LT 2.0T

VEHICLE TYPE: front-engine, rear-wheel-drive, 4-passenger, 2-door coupe
PRICE AS TESTED: $36,525
BASE PRICE: $26,695
ENGINE TYPE: turbocharged and intercooled DOHC 16-valve inline-4, aluminum block and head, direct fuel injection
DISPLACEMENT: 122 cu in, 1998 cc
POWER: 275 hp @ 5600 rpm
TORQUE: 295 lb-ft @ 3000 rpm
TRANSMISSION: 6-speed manual

DIMENSIONS
WHEELBASE: 110.7 in
LENGTH: 188.3 in
WIDTH: 74.7 in
HEIGHT: 53.1 in
PASSENGER VOLUME: 85 cu ft
TRUNK VOLUME: 9 cu ft
CURB WEIGHT: 3410 lb

C/D TEST RESULTS

ZERO TO 60 MPH: 5.4 sec
ZERO TO 100 MPH: 15.0 sec
ZERO TO 130 MPH: 30.3 sec
ROLLING START, 5–60 MPH: 6.4 sec
1/4-MILE: 14.1 sec @ 97 mph
TOP SPEED (C/D EST): 145 mph
BRAKING, 70–0 MPH: 170 ft
ROADHOLDING, 300-FT-DIA SKIDPAD: 0.89 g

FUEL ECONOMY
EPA COMBINED/CITY/HWY: 24/21/30 mpg
***C/D* OBSERVED:** 19 mpg

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photography by CHARLIE MAGEE

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Pace, Space, Etc.

Dignity intact, Jaguar blends beauty, utility, and performance in its first SUV, the **F-Pace** crossover. _by Dave VanderWerp

JAGUAR OFFICIALS KEEP STEERING the discussion of the company's first SUV, the F-Pace, to its sporting credentials and its somewhat tenuous visual and mechanical (and nomenclatural) connection to the F-type sports car. And all this sporty talk almost makes it sound as if Jaguar wanted to build a road-ripping crossover, even if it compromised rear-seat and cargo space.

But that's not the case. The F-Pace's slinky yet restrained brawn and its dynamic excellence are augmented with serious practicality. Its back seat, for instance, easily accommodates occupants more than six feet tall, with excellent rear legroom, ample foot space under the front seats, and, considering the standard panoramic sunroof, surprisingly reasonable headroom. The generous cargo hold is nearly twice as spacious as that of the Porsche Macan.

And the F-Pace is no dynamic slouch, either. It offers exceptionally sharp on-center steering precision and great turn-in response. The steering effort is on the light side, but that likely helps impart a feeling of friskiness (selecting dynamic mode adds additional heft). Also helping is a claimed 50/50 weight distribution and an all-wheel-drive system that remains rear-drive until front-axle torque is needed. Body control over broken pavement is excellent, and the structure and steering column feel extraordinarily rigid. Even the ride comfort on the upsized 22-inch wheels is better than expected.

Aiding the ride is Jaguar's stubborn refusal to employ run-flat tires, which we salute, and this means—hooray!—the inclusion of a compact spare tire, an increasingly rare feature. However, the brake response is soft and unsatisfying, and the throttle response in dynamic mode is far too jumpy at high rpm. Toeing back into the throttle midcorner often causes such a strong surge that, in our hands, it hurled the F-Pace headlong into an intervention from the stability control. And, sure, fearless types can turn off the stability control and chuck it into a corner like, say, an F-type, but it will just spin its inside tires due to the lack of limited-slip differentials. Alas, let's not get too crazy; the F-Pace is a crossover, after all. Subtler technologies, such as brake-based torque vectoring, which is transparent from behind the wheel, help rotate the SUV into corners.

All the vehicles we drove were equipped with the $1000 Adaptive Dynamics package—optional on the Prestige and R-Sport and standard on S and First Edition trim levels—that includes electronically adaptive Bilstein shocks. This package usefully allows customization of the F-Pace's dynamic mode from a menu of separate engine, transmission, steering, and suspension settings. The ride is seriously tied down in dynamic mode, so the normal setting is the way to go when traveling over any kind of cratered surface, as it provides more suspension travel.

[+] Sporting looks, capable handler, spacious.
[–] Mushy brake pedal.

One caveat: The F-Paces we flung around the mountainous roads of Montenegro all wore Pirelli P Zero summer tires. P Zeros, however, will be available in the U.S. only on the 275 highly optioned $70,695 First Edition models. Every other F-Pace will wear all-season rubber, which certainly will erode some of the dynamic excellence we experienced.

With the handsome and practical F-Pace, Jaguar now has five compelling model lines on offer. If that's not enough to light the sales charts on fire, all hope is lost.

The F-Pace is based on a similar rear-drive architecture to that of the XE and XF sedans, including a body structure that's 80 percent aluminum. But once the SUV stuff (higher ground clearance, additional suspension travel, and more mass) is taken into account, fully 81 percent of the F-Pace's components are new. Its 113.1-inch wheelbase is an enabler for its spaciousness; in fact, the F-Pace is a dimensional tweener, splitting the difference between BMW's compact X3 and mid-size X5 crossovers in that dimension.

It's surprising that the F-Pace doesn't get Jag's 2.0-liter turbocharged gasoline engine, considering that a 2.0T anchors most of its competitors' lineups. Instead, the volume engine is the familiar 3.0-liter supercharged V-6 shared with various Jaguar and Land Rover vehicles, available in either 340- or 380-hp states of tune (base prices: $43,385 and $57,695). Although the 20-mpg EPA combined rating isn't stellar, we can't say we mind, because the V-6 emits an invigorating, edgy rasp as it snarls toward redline. It's worthy of a windows-down blast through a tunnel, yet it doesn't drone when cruising.

We expect a 4.9-second run to 60 mph in the 380-hp S version. The ubiquitous ZF-engineered eight-speed automatic is the only transmission, and it delivers nothing but smooth shifts. Responses to requests from the shift paddles are reasonably prompt, and downshifts could only be made better by a more dramatic throttle blip.

The other engine, which will be added to the U.S. lineup this fall in the $41,985 entry-level model, is an all-new 2.0-liter four-cylinder turbo-diesel. Don't be fooled by its 180-hp rating; its 318 pound-feet of torque means the diesel doesn't want for muscle. An estimated 7.8-second zero-to-60-mph time isn't exactly blistering, but the only time it feels flat-footed is with an aggressive stab of the accelerator from rest. Although the diesel at times sends some untoward vibrations through the cabin, it is quiet throughout the rev range.

Attempting to right Jaguar's recent infotainment sins is the company's new InControl Touch Pro system, part of a $3200 Technology package (again, only available on the top trims). It adds a 17-speaker Meridian stereo as well as a 10.2-inch center screen and a 12.3-inch unit as a virtual gauge cluster. Jaguar has been developing this extremely responsive touchscreen infotainment system for four years, and it's new from the Intel quad-core processor out. However, it doesn't yet accommodate Android Auto and Apple CarPlay functionality (those are coming later). It's worth noting that the base 8.0-inch infotainment system, called InControl Touch, is fundamentally different and not based on the new hardware.

With all the available screen real estate in the cluster, we expected richer vehicle-information displays. In a spectacular failure of imagination, only one data point of trip information, such as fuel economy or remaining range, can be displayed at a time. And it's controlled via the turn-signal stalk, just as it was on the new-for-2004 Jaguar XJ's tiny dot-matrix display screen.

With athletic good looks and dynamic driving character, excellent rear-seat and cargo space, pricing that puts it in the heart of its segment, and a new five-year/60,000-mile warranty with service included, all indicators look positive for the F-Pace. It, along with the compact XE sedan, should significantly grow the Jag brand. No matter how many F-Paces are sold, it will deserve more customers. It's that compelling.

2017 JAGUAR F-PACE

VEHICLE TYPE: front-engine, all-wheel-drive, 5-passenger, 4-door hatchback
BASE PRICE: $41,985–$70,695
ENGINES: turbocharged and intercooled DOHC 16-valve 2.0-liter diesel inline-4, 180 hp, 318 lb-ft; supercharged and intercooled DOHC 24-valve 3.0-liter V-6, 340 or 380 hp, 332 lb-ft
TRANSMISSION: 8-speed automatic with manual shifting mode

DIMENSIONS
WHEELBASE: 113.1 in
LENGTH: 186.3 in
WIDTH: 76.2 in
HEIGHT: 65.0 in
PASSENGER VOLUME: 96 cu ft
CARGO VOLUME: 34 cu ft
CURB WEIGHT: 4150–4250 lb

PERFORMANCE (*C/D* EST)
ZERO TO 60 MPH: 4.9–7.8 sec
ZERO TO 100 MPH: 11.9–20.0 sec
1/4-MILE: 13.6–16.0 sec
TOP SPEED: 129–155 mph

FUEL ECONOMY (MFR'S EST)
EPA COMBINED/CITY/HWY: 20–28/18–26/23–31 mpg

Jagbit

KEY-PING PACE

Although smartphone apps to lock and unlock vehicles are proliferating as an alternative to the key fob, what happens when the activities turn wet, or generally fob- or phone-unfriendly? Enter Jaguar's $400 Activity Key, a 21st-century take on Ford's ubiquitous door-mounted keypad. It's a rubberized, waterproof-to-98-feet bracelet that closely resembles a Fitbit and operates as a second key fob. Tapping it on the letter J on the liftgate locks the vehicle and disables the main key fob, which remains inside the vehicle. Unlocking requires another letter tap, but first click the liftgate release button, which starts the antenna searching for the band's radio-frequency identification signal. There's no battery, so no recharging. Clever. ***—DV***

Reinforcing the Fleet Family Freighter

Volvo's **V60 POLESTAR** gets faster for 2017. _by Kevin A. Wilson

IF YOU SPOT THIS BLUEBIRD IN THE WILD, alert the Audubon Society. Only 1 percent of new cars sold in America are wagons, but this latest limited-edition V60 from Volvo's Polestar performance division is rarer still.

Polestar is racing in this year's World Touring Car Championship (WTCC), and we snagged a drive in its 2017 streetgoing wagon and sedan models at and around the Circuit Paul Ricard in southern France, coincident with the season's first WTCC race there. The chassis is much the same as when the model was introduced for 2015, but all is new under the hood. The former 3.0-liter turbocharged inline-six gives way to Volvo's latest T6, a supercharged and turbocharged 2.0-liter four-cylinder, while an eight-speed automatic supplants the old six-ratio unit. The all-wheel-drive system that Polestar recalibrates to deliver more torque to the rear axle carries over. Polestar gets 362 horsepower from the T6, up 60 from stock, or 17 more ponies (but 22 less pound-feet of peak torque) than the 2016 six-cylinder.

[+] Athletic, unique, still holds cubic cargo.
[–] Would be more fun with a manual, dated interior, priced in cubic dollars.

The automatic is the only available transmission, which is sad because the car begs for a manual option. Polestar does reprogram the Aisin eight-speed for quicker, crisper shifts, and if you pull the shifter left to sport mode, a valve in the exhaust opens to let the engine sing. Think Tom Waits's kind of singing, all growling intensity, where the six had Martin Sexton's range.

Volvo says the 2017 car is 0.3 second quicker to 60 mph. We'll test it later to confirm that, but we can say the engine feels fat on midrange torque, and with the extra gears, the new car comes across as sharper and more eager. The transplant cuts 44 pounds of mass and shifts the balance rearward. Polestar's suspension rework includes bushing swaps in both the suspension and subframes, and it also breathes more life into the steering. Road-texture feedback is negligible, but the weight builds proportionally with g-forces and there are no dead zones, even in the lightest of the three settings available (selectable only at a standstill, for some reason) on a personalization menu in the touchscreen.

2017 VOLVO V60 POLESTAR

VEHICLE TYPE: front-engine, all-wheel-drive, 5-passenger, 4-door hatchback
BASE PRICE (EST): $63,000
ENGINE TYPE: turbocharged, supercharged, and intercooled DOHC 16-valve inline-4; aluminum block and head; direct fuel injection
DISPLACEMENT: 120 cu in, 1969 cc
POWER: 362 hp @ 6000 rpm
TORQUE: 347 lb-ft @ 3100 rpm
TRANSMISSION: 8-speed automatic with manual shifting mode

DIMENSIONS
WHEELBASE: 109.3 in
LENGTH: 182.5 in
WIDTH: 73.4 in
HEIGHT: 58.4 in
PASSENGER VOLUME: 93 cu ft
CARGO VOLUME: 28 cu ft
CURB WEIGHT: 3950 lb

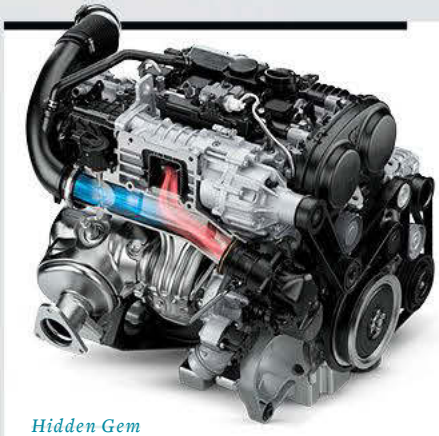
PERFORMANCE (C/D EST)
ZERO TO 60 MPH: 4.6 sec
ZERO TO 100 MPH: 11.5 sec
1/4-MILE: 13.2 sec
TOP SPEED: 155 mph

FUEL ECONOMY (C/D EST)
EPA COMBINED/CITY/HWY: 24/20/28 mpg

Where the factory's hottest sled, the V60 R-Design, wants to push off the outside of a turn, Polestar's V60 hunkers down and dives for the apex. With its center of gravity farther aft than the sedans', the wagon rotates especially well and it's easy to balance the remaining trace of understeer with a firm poke at the throttle.

This is one reason to prefer the wagon over the Polestar S60 sedan. Another is that performance-tuned wagons are even rarer today than they were two years ago. Cadillac gave up on the CTS-V wagon, Audi and BMW opted out of offering us their hotted-up station cars, and Mercedes-AMG's long-roof E63 costs about twice this Volvo's $63,000 estimated price. Even so, Mercedes leaves its C63 Estate behind in Europe. Blame our two-tier fuel-economy regs, which treat an AWD wagon-on-stilts (see: Volvo XC70) like a truck while real wagons face stiffer car requirements.

Volvo performance nuts are as rare as spotted owls, and their numbers will not grow significantly. Most of the "few hundred" Polestar cars, we're told, will be this pretty but pricey wagon. Sedan buyers will find many four-door alternatives to the S60 Polestar, but if you want to fly low and fast with a tailgate, hunt down this bird.



Hidden Gem

SPORT-PLUS MODE

Volvo's supercharged and turbocharged 2.0-liter four-cylinder made itself known for high specific output, radical complexity, and nerd appeal when it was introduced in the 2015 S60, V60, and XC60. Its latest application in the Polestar models adds another twist to the engine's eccentricity. Designed to fill in the bottom end of the power band, the supercharger only operates below 3500 rpm, where most driving happens. On a track, however, that equation is reversed as drivers demand peak power. Sport-plus mode activates a transmission calibration that shifts automatically to keep the engine above 4000 rpm whenever possible. Engage the hidden turbo-only mode by pulling the gear lever into sport and pushing it forward. Hold it there while pulling back twice on the downshift paddle to the left of the steering wheel. Look for the green S light to blink twice in the instrument panel. What was that about complexity again? *—Josh Jacquot*

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62590/68048 shown

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69129/69121/877 shown

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Customer Rating ★★★½☆

LOT 95275 shown
60637/61615

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Customer Rating ★★★★½

NEW

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Customer Rating ★★★★★

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LG	68497/61360
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Open for the Season

The Mercedes-Benz **S-class cabriolet** returns after a decades-long absence. _by Joe Lorio

MERCEDES-BENZ HAS BUILT a two-door version of its range-topping S-class for years, but it hasn't offered a convertible variant since 1971. Sun seekers could cruise palm-lined boulevards in an SL roadster or, for a time, an SLS AMG, but four-seat convertible options topped out with the E-class. Now, Mercedes is back in the high-luxe, four-place convertible casino with the 2017 S-class cabriolet.

The reborn cabriolet is available in three models that mirror those of the largely identical S-class coupe: a 449-hp S550 with a 4.7-liter twin-turbo V-8, an AMG S63 with its 577-hp 5.5-liter twin-turbo V-8, and an AMG S65 that features a twin-turbo V-12 making 621 horsepower and 738 pound-feet of torque. The S550 cabriolet is rear-drive only, the rationale being that it's likely to sell predominantly in warm-weather climates. The S63 cabriolet is all-wheel drive, like the coupe, mostly to aid in putting the engine's tremendous power to the ground. The S65 seemingly could use all-wheel drive for the same reason, but the 12-cylinder engine doesn't leave room for front drive gear.

The windshield-mounted deployable wind deflector looks ridiculous, but at least it creates truly spectacular hair sculptures.

Mercedes set us loose in the S-class cabriolet in what the company no doubt feels will be its home turf, France's Côte d'Azur. Our S550 did indeed feel appropriately fab gliding down the oceanfront Promenade des Anglais near Nice. Threading it through the busy city center, however, made the S-class feel like the *Oasis of the Seas* sailing up the Gowanus Canal.

We were happy to get out of the city and onto the switchbacks. Here, the cabriolet's precise helm and small steering wheel made this wide machine feel surprisingly wieldy. Sport mode raises the steering-effort levels slightly, and it's easy to get into a rhythm with the S-class on a serpentine road. Also in sport mode, the body motions go from relaxed to a bit tighter, and yet the ride is not uncomfortable despite our car's optional 20-inch wheels. Their Michelin Pilot Sport 3 rubber jackets keep the tonnage on the intended line without protest. Switching later to an S63, we found that model's comfort mode to be similar to the S550's, but its sport mode is more aggressive, to the point where harsh impacts can upset your noble wafting. Cowl shake, however, remains completely absent.

The biggest difference between the two V-8 models comes in their powertrains. Both of these engines are potent enough to shrug off the cabriolet's extra cottage cheese, which is 112 to 139

[+] Indulgent interior, undeniable street presence, more nimble than you'd expect. [–] Ride can be firm, gauges wash out in bright sunlight, rear-seat space is limited.

2017 MERCEDES-BENZ S-CLASS CABRIOLET

VEHICLE TYPE: front-engine, rear- or all-wheel-drive, 4-passenger, 2-door convertible
BASE PRICE: $132,325–$251,000
ENGINES: twin-turbocharged and intercooled DOHC 32-valve 4.7-liter V-8, 449 hp, 516 lb-ft; twin-turbocharged and intercooled DOHC 32-valve 5.5-liter V-8, 577 hp, 664 lb-ft; twin-turbocharged and intercooled SOHC 36-valve 6.0-liter V-12, 621 hp, 738 lb-ft
TRANSMISSIONS: 7- or 9-speed automatic with manual shifting mode

DIMENSIONS
WHEELBASE: 115.9 in
LENGTH: 197.9–198.6 in
WIDTH: 74.8–75.2 in
HEIGHT: 55.8–56.2 in
TRUNK VOLUME (TOP DOWN/UP): 9/12 cu ft
CURB WEIGHT: 4850–5000 lb

PERFORMANCE (*C/D* EST)
ZERO TO 60 MPH: 3.8–4.6 sec
ZERO TO 100 MPH: 8.7–10.9 sec
1/4-MILE: 12.2–13.2 sec
TOP SPEED: 155–186 mph

FUEL ECONOMY (*C/D* EST)
EPA COMBINED/CITY/HWY: 15–19/12–15/19–23 mpg

pounds more than the coupe's total. The S550's mostly silent 4.7-liter V-8 pairs with Mercedes' nine-speed automatic, which can be a bit busy when just cruising but is sporting enough to snap off an F1-quick downshift or two (particularly in sport mode) when braking into corners. The AMG S63's 5.5-liter unit is more vocal, an angry drunk German in pinstripes, making pops on the overrun that are a little unseemly for a car like this. The S63's AMG Speedshift MCT seven-speed automatic is also plenty eager to downshift under braking, and if you go to the paddles, it shifts very quickly. And while the S550 is no soggy bun, either, bury the S63's throttle and the acceleration is eye widening. Unless you rule your own emirate, it's hard to find a place to use all that thrust. We predict a zero-to-60-mph time of 3.8 seconds for the S63 and a 4.6-second run for the S550, with the S65 falling somewhere in between.

Besides the brawnier powertrain, the S63 also includes a head-up display, massaging seats with more-prominent side bolsters, 20-inch wheels (instead of 19s), and various exterior styling tweaks. Most of these extras also can be added to the S550.

We've called the S-class coupe "a stunner," saying it exudes "power and opulence and status." The same goes for the cabriolet. The big change is the replacement of the steel top with a power-folding softtop. With the top up, the cabin is quiet enough to serve as a confessional.

The roof can be raised or lowered at speeds up to 37 mph. Top down, our white-and-navy-blue S550 with its matching white-and-navy interior looked like a yacht for the street, loudly marking the moment that your ship has finally come in. That interior color scheme is one of six offered, complemented by four roof-color choices.

The convertible's interior is the same as the one we've lauded in the coupe, with an upper dash that wraps into the door panels.

Headrest HVAC vents are nice and all, but shouldn't a truly opulent convertible be offered with heated, silk footie pajamas? Monogrammed, of course.

It's particularly striking when fitted with the optional ship's-deck planked wood trim. *Ahoy.* The virtual instrument cluster, however, tends to wash out in bright sun (that's when the head-up display comes in handy). A chrome band surrounds the open interior compartment, and two artfully perforated stainless-steel speaker grilles in the hard tonneau cover add some zing to the car's top-down appearance.

Within the opulent cabin, the driver and passenger sit on lounge-like chairs with under-thigh extenders. The two-person back seat is reasonably wide, and its backrest is comfortably angled. But rear-seat legroom disappears if the front seats are moved all the way back to their NBA-inseam position.

Mercedes goes to great lengths to make top-down driving comfortable in cool temperatures. The so-called Aircap is a strange-looking windshield-mounted wind deflector that minimizes buffeting. It works in concert with a mesh wind blocker that rises from behind the rear seats. If that look offends your aesthetic sensibilities, as it does ours, know that simply raising the windows is equally effective. There also are heated seats and the brand's Airscarf vents, which blow warm air from the base of the headrests. A heated steering wheel, heated armrests, and heated rear seats are optional.

As amusing as the S63 (and, presumably, the S65) can be, we are left thinking the S550's more subdued powertrain and mellower suspension tune make it the better-realized take on this concept. After all, when you're soaking up the rays in a glamour machine like this, what's the big rush?

TESTED

An Occluded Front

Kia's revised, odd-looking **Sportage** trades power for fuel economy. Or so says Kia. _by Mike Sutton

WE WON'T CALL THE REDESIGNED 2017 Kia Sportage ugly, but it is an odd-looking sort of Korean Peugeot. Leading with a Gallic nose, it's handsome enough along the sides and in back and hardly forgettable. While such bold restyling does not always guarantee notable advancements underneath, this new model is another case of the Korean manufacturer making meaningful generation-over-generation improvements.

Kia's updated platform for the Sportage has grown slightly in length and wheelbase, which contributes to a more comfortable back seat and a modest bump in cargo volume to 31 cubic feet, five cubes more than before yet still on the small side for compact crossovers. Folding the second row flat nearly doubles the size of the hold, though, and the rear hatch on top trims will open automatically after a couple seconds of key-fob proximity.

The foundation is also much stiffer than before, allowing the reworked suspension to be tuned for more compliance over rough roads, even with the firmer dampers and 19-inch wheels on our all-wheel-drive, top-hole SX Turbo example (lesser models have 17s or 18s). It's still not as rewarding to drive as our segment favorite, the Mazda CX-5. But the Kia's body motions are well checked, and revisions to the electrically assisted steering lend a more precise feel than before. The firm brakes have respectable stopping power (174 feet from 70 mph).

[+] Newfound on-road refinement, classy interior, solid value. [–] That bizarre front end, efficiency claims fail to materialize.

A 181-hp 2.4-liter four-cylinder is standard, but SX models retain a turbocharged 2.0-liter four, which for 2017 trades 20 horsepower for additional claimed mileage and midrange response. The output is now 240 horsepower (237 with all-wheel drive) and 260 pound-feet of torque, yet the detuned SX was actually thirstier in our testing than all the previous-gen turbocharged Sportages we've sampled. It averaged just 19 mpg in mixed driving. Front-wheel drive and a six-speed auto with paddle shifters (SX only) are standard, and all-wheel drive is $1500 extra.

Despite being less powerful and about 100 pounds heavier than before, our 3768-pound tester posted a solid 6.9-second zero-to-60-mph time and covered the quarter-mile in 15.4 seconds at 91 mph. That pace is slightly quicker than our old long-term 2012 Sportage SX AWD and similar to other compact utes with optional turbo-four and V-6 engines, such as the Ford Escape and Jeep Cherokee, though the SX Turbo still trails the 250-hp Subaru Forester XT in both a straight line and fuel economy. Weak throttle-tip-in response and a hint of turbo lag manifest in an abrupt surge of power as the revs rise, which can make smooth getaways tricky. But at least Kia now allows you to adjust the throttle and shift programming via normal, sport, and eco drive modes, with the latter the most effective at smoothing out the power delivery.

Although the Kia's cabin remains utilitarian, it's been updated with richer materials and more-supportive seats. Flashy details are few, yet the execution feels upscale. SX models come fully loaded with heated and cooled leather front seats, a touchscreen infotainment system, and the brand's latest driver aids, including lane-departure warning and automatic emergency braking. A huge panoramic sunroof also is included on the Turbo, as are the arachnid-like quad-LED fog lights.

While the 2017 Sportage's $23,885 entry price is less than a grand more than the 2016 model's, the all-wheel-drive SX's added equipment ups the cost over the old SX by $2510, to $34,895. Yet even with our example's middling efficiency in the real world, its performance, refinement, and amenities make this new Kia entirely attractive. In the figurative sense, at least.

2017 KIA SPORTAGE SX TURBO AWD

VEHICLE TYPE: front-engine, all-wheel-drive, 5-passenger, 4-door hatchback
PRICE AS TESTED: $34,895
BASE PRICE: $34,895
ENGINE TYPE: turbocharged and intercooled DOHC 16-valve inline-4, aluminum block and head, direct fuel injection
DISPLACEMENT: 122 cu in, 1998 cc
POWER: 237 hp @ 6000 rpm
TORQUE: 260 lb-ft @ 1450 rpm
TRANSMISSION: 6-speed automatic with manual shifting mode

DIMENSIONS

WHEELBASE: 105.1 in
LENGTH: 176.4 in
WIDTH: 73.0 in
HEIGHT: 65.8 in
PASSENGER VOLUME: 98 cu ft
CARGO VOLUME: 31 cu ft
CURB WEIGHT: 3768 lb

C/D TEST RESULTS

ZERO TO 60 MPH: 6.9 sec
ZERO TO 100 MPH: 18.9 sec
ZERO TO 120 MPH: 34.0 sec
ROLLING START, 5–60 MPH: 7.5 sec
1/4-MILE: 15.4 sec @ 91 mph
TOP SPEED (MFR'S EST): 130 mph
BRAKING, 70–0 MPH: 174 ft
ROADHOLDING, 300-FT-DIA SKIDPAD: 0.83 g

FUEL ECONOMY

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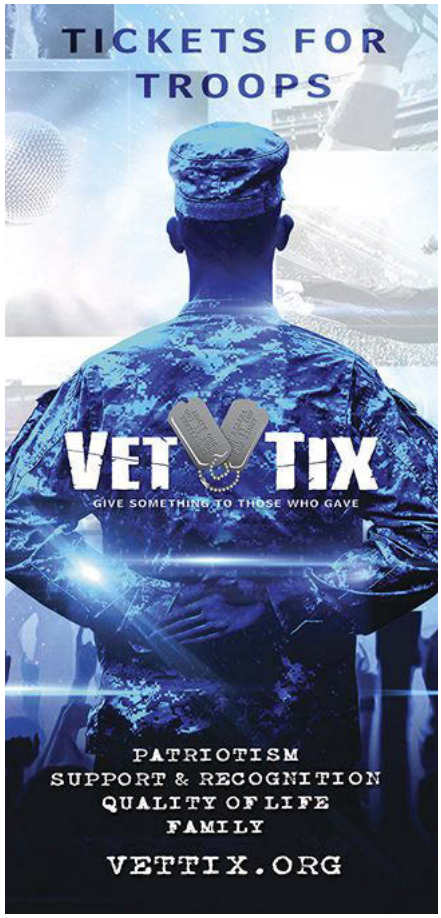

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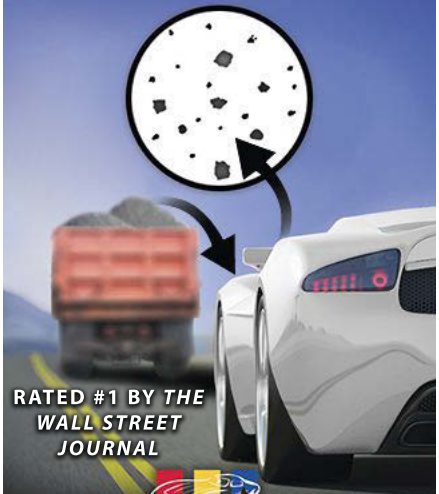
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How We See It: Autonomy

The fully automated car will never happen. We don't say this because the word "Driver" is in our name, or because we see the automated car as a threat to our magazine's existence. We say it for one very simple reason: Automated cars will require closed (yet vulnerable) networks of vehicles in constant communication, and as long as Main Street is a place where there are motorcycles, cyclists, people, and dogs, it will never be a closed network. There will never be an automated dog, much as we find that notion intriguing, and dogs will never be able to communicate with cars. Barking doesn't count.

There are other reasons why full automation will never happen, but they only serve to underscore the point above: Unless every object in the streetscape is fully automated, nothing can be. Sure, the insurance lobby will fear cars that promise not to crash and will fight their advancement. Carmakers will be loath to assume all responsibility for a car's actions. The ethical issues, such as whether a skidding car should hit a single mother or a father of five, have been well documented and will be significant, of course. As will carsickness, the psychological loss of control, the absence of self-determination. But nothing will keep the car from being fully, completely automated like a dog with free will.

According to the Society of Automotive Engineers (SAE), there are six stages of automotive automation. **We are in the third,** wherein the many features loaded into our cars seek to keep us in our intended lane and at the appropriate distance from the car ahead. The fourth is close, but not without issues. The sixth stage is the complete absence of driver involvement. It is our assertion that we will never get to the sixth stage. The unfettered movement of fully automated cars among free agents will require a system that contains some element of risk, and risk is antithetical to automation.

No, we're about where we'll stay forever, with incremental improvements, in the same way planes have long been capable of automation and yet still require pilots. Maybe it's because nobody wants to board an Airbus A380 to Melbourne and see an empty cockpit. Or maybe it's because an animal could get through the runway fence.

THE SIX STAGES

SAE STANDARD J3016

NO AUTOMATION
Old-school motoring with a human driver, a steering wheel, and, ideally, a clutch pedal, and an attractive passenger in the right-hand seat.

DRIVER ASSISTANCE
Steering *or* braking/acceleration can be performed by the vehicle, based on the environment and the situation. The driver is in control the rest of the time.

PARTIAL AUTOMATION
Coordinated steering *and* braking/acceleration are performed automatically by the vehicle, based on the environment and the situation. The driver does the rest of the driving.

CONDITIONAL AUTOMATION
The vehicle can assume all aspects of the driving task, but the driver will intervene as necessary.

HIGH AUTOMATION
The vehicle can assume all aspects of the driving task and keeps on doing so if the driver does not respond to intervention prompts.

FULL AUTOMATION
The Robots are in control, driving all the time. Nothing to worry about. But they will be needing your liver.

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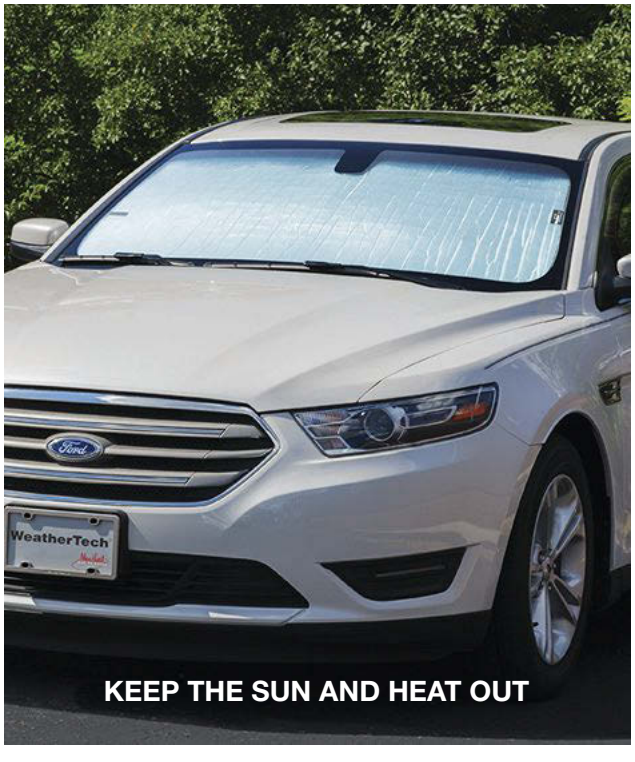

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THE TALE OF THE ALL-NEW 2016

SILVERADO Z71

STRAIGHT FROM THE FOLKS WHO MADE IT

What does it take to make Silverado dependable and long-lasting? We sat down with two of the Chevrolet chief engineers behind the 2016 Silverado to find out what makes the Z71 live up to its legendary badge.

JEFF LUKE

CHEVROLET CHIEF ENGINEER,
FULL-SIZE AND MIDSIZE TRUCKS

The Silverado Z71 occupies a special place in the Silverado lineup and in the hearts of its owners. What makes people so loyal to this vehicle?

Owners will tell you, "I drive a Z71," rather than "I drive a Silverado." The Z71 has a very distinct presence. It makes a statement with unique Z71 badging on the grille and bed and an off-road screen in the Driver Information Center. Many of our Special Editions are built as Z71 models, so customers get the promise of performance whether they use their vehicle in off-road environments, for work, or for just having fun. Z71 boasts Rancho® monotube shocks that are specifically tuned for great off-road handling, and underbody shielding to ensure protection of the transfer case.

The new-generation Z71 also has Hill Descent Control, which helps the driver have complete confidence when descending down a steep decline. That's the kind of capability we've designed into the Z71 Package. I'd like to think that Z71 is the lead Chevrolet vehicle for "finding new roads." Literally.

How do you balance increasing Z71 off-road capabilities with its highway performance?

We don't believe in the word compromise. We do believe in figuring out how to get our customers what they need and what they want: great off-road capability and excellent on-road highway performance and refinement. Everything is purposeful and practical.

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Jeff Luke
CHEVROLET CHIEF ENGINEER, FULL-SIZE AND MIDSIZE TRUCKS

JORDAN LEE

CHEVROLET GLOBAL CHIEF ENGINEER AND
PROGRAM MANAGER, SMALL BLOCK ENGINES

The Chevy Small Block V8 is legendary. Was it difficult to squeeze more improvements out of this new, fifth-generation version, the EcoTec3 V8?

When I was a younger engineer, I thought most of the big advancements in efficiency had been made, but I learned that there are still a lot of technologies and improvements to explore. For example, the fifth-generation Small Block engine has had significant improvements over the previous generations. Direct Injection, Variable Valve Timing and Active Fuel Management™ are technologies that are fundamental to its design. Direct Injection injects fuel directly into the cylinder. This aids in keeping the combustion chamber cool, which means it can tolerate a higher compression ratio for increased power. Variable Valve Timing improves the breathing efficiency of the engine so it can make more power and more torque.

Active Fuel Management deactivates four cylinders when the truck is under light loads, which translates to better fuel economy.[1] These three technologies — Direct Injection, Variable Valve Timing and Active Fuel Management — work very well together and collectively result in better performance and fuel economy. For example, Direct Injection and Variable Valve Timing combine to allow higher compression and better breathing efficiency. This means more power and allows the engine to stay in 4-cylinder mode longer, which means better fuel economy.[1] No other truck manufacturer is using all three of these engine technologies together. My team and I are very proud of how well these technologies complement each other in the real world. We're also proud of the fact that we can offer these technologies as standard equipment on every Silverado. The EcoTec3 V8 in the Silverado Z71 is a great new chapter in the Chevy Small Block's legendary history.

CHEVROLET
FIND NEW ROADS™

1 *EPA-estimated 16 MPG city/23 highway (2WD), 16 MPG city/22 highway (4x4) with available 5.3L V8 engine and 6-speed automatic transmission, 16 MPG city/22 highway (2WD), 15 city/21 highway (4x4) with available 5.3L V8 and 8-speed automatic transmission, 15 MPG city/21 highway with available 6.2L V8 engine.*

PERFECT HARMONY

20MM WERE SHAVED FROM THE WHEELBASE. THE ENGINE WAS MOUNTED 12.5MM LOWER. AND OVER 148 POUNDS WERE SHED. METICULOUS DETAIL WENT INTO BUILDING THE NEW MAZDA MX-5 MIATA. IN FACT, ONLY WHEN YOU'RE IN THE DRIVER'S SEAT CAN IT ACHIEVE ITS NEAR-PERFECT 50/50 WEIGHT DISTRIBUTION. AND IT'S NOT JUST THE MX-5 THAT RECEIVES THIS KIND OF ATTENTION; IT'S EVERY CAR WE BUILD. IN THE END, WE DO THIS FOR ONE SIMPLE REASON.

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